VOL. 3 JANUARY No. 8

MONTANA WILD LIFE

LARGEST TROUT REARING PONDS IN THE WORLD.
BUTTE ANGLERS CLUB
MAIDEN ROCK — BIG HOLE RIVER

BIENNIAL REPORT. 1929-1930
Montana State Fish and Game Department

Recompense

By Douglas Malloch

WHEN some one has slipped you a dirk in the dark,
When eyes that are loving are lies;
When some one you trusted has made you a mark,
And somehow the heart in you dies;
There's dirt for you, hurt for you, trouble enough
To shatter the faith of a man;
But don't ever think there is trouble so tough,
That you can't overcome it—you can.

When living is losing its flavor to you
When worry is making you old;
When there is no joy in the thing that you do,
Nor truth in the thing you are told;
There's balm for you, calm for you out in the wild,
There's hope for you up on the hill;
Get up in the timber and play like a child;
You can overcome it—you will.

Get up in the timber; the trail and the trees
Will make you a man in a day.
The smell of the soil and the breath of the breeze,
Will blow all your troubles away.
There's pine for you, wine for you, hope for you there;
The sun and the moon and the star—
If the ways of the city are not on the square,
Get out in the woods—where they are.

His Excellency,
J. E. Erickson,
Governor of Montana,
Helena:

The State Fish and Game Commission herewith submits the biennial report of its activities and achievements for 1929-1930.

MONTANA STATE FISH AND GAME COMMISSION

Thomas N. Marlowe, Chairman

J. L. Kelly — *W. K. Moore*
E. A. Wilson — *G. T. Boyd*

Robert H. Hill, Secretary of the Commission and State Fish and Game Warden

Remnants of THUNDERING HERDS

REMNANTS OF MONTANA'S ONCE MIGHTY HERDS

SPRINGTIME IN THE ROCKIES

AN OLD BULL OUTCAST FROM THE HERD

INDIAN SUMMER ON THE BUFFALO RANGE

PHOTOS BY W. M. RUSH

ON THE FALL RANGE

MONTANA WILD LIFE

The Official Publication of The State Fish and Game Commission

VOL. III HELENA, MONTANA, JANUARY, 1931 NO. 8

Plans for the Future

By THOMAS N. MARLOWE, Missoula, Chairman Montana State Fish and Game Commission

PORTSMEN of Montana, who have gone afield annually into the great outdoor laboratory with an area of more than 90,000,000 acres called The Treasure State, are now spending $2 each for the privilege of taking fish and game. During 1929 the peak of resident license sales was reached when 83,338 licenses were placed in the hands of anglers and hunters. At $2 each, the investment reached a total of $166,676. In compliance with the state law, 25 cents out of every license fee is placed in the biological fund, from which bounties are paid on predatory animals by the Montana Livestock Commission and from which fund payment is made for employment of predatory animal hunters in cooperation with the Livestock Commission and the Biological Survey department of the federal government. This subtraction meant the placing of $21,835 in the biological fund. Ten cents from the sale of each license is paid the dealer. No fee is charged when the license is sold by a warden. Hence out of each $2 license fee, if all licenses were sold by dealers, the State Fish and Game Department has received but $1.65. Out of the total fund of $166,676 paid for resident licenses in 1929, the department received for general administration purposes the sum of $137,507.70. I believe it is a conservative estimate that the purchaser of each resident hunting and fishing license spent on an average during the year the sum of $50.00 for shotguns, rifles, ammunition, fishing tackle, hunting and fishing clothes, guides, boats, gas and oil and wear and tear on cars used in hunting and fishing trips. These figures are significant. In the final analysis, they mean that in 1929 the 83,338 resident sportsmen of Montana paid $166,676 into a fund for the purpose of creating a fish and game supply and at the same time they paid out the astonishing total of $4,176,900 for implements with which to destroy it.

Each year we are growing more and more proficient in the taking of fish and game. Each year finds our instrumentalities for taking fish and game more and more deadly. Each year finds the sportsmen with more and more time on their hands for using these instrumentalities. Hunting and fishing is so popular today in Montana that far more people indulge in it than any other kind of sport. The funds for putting back game fish, birds and big game to take the places of those included in the bags of lovers of the out-of-doors are not keeping pace with the funds expended by the sportsmen in the taking of wild life. The balance is on the wrong side of the ledger. The drain upon our supply of fish and game is so great today that more artificial propagation must be resorted to if satisfactory hunting and fishing conditions are to be obtained. Some sportsmen, however, seem to think that some special providence is going to look after the supply of fish and game and that they are not going to be called upon to do anything about it. But those who are acquainted with the effort, yes the struggle, that is being made to protect our present supply and to propagate more, know that this is not the case. Additional revenue is needed if sportsmen of the state desire the program of conscientious conservation and propagation undertaken by the State Fish and Game Commission to proceed without handicap.

Thirty states in the Union today charge a higher resident hunting and fishing license than the $2 prevailing in Montana, yet none offers more in hunting and fishing. Nineteen other states charge a higher non-resident fishing fee than the $3.50 prevailing in Montana, yet nowhere in the nation is the trout fishing of Montana equalled. Because of these facts thousands of eastern visitors are annually looking toward Montana as their summer playground and the drain on our wild life resources continues. Reparation is mandatory unless we want to sit idly by and permit our streams to become as barren as those of the east and our forests and fields shorn of their wild life.

Montana's State Fish and Game Department can go only so far as permitted by funds paid by sportsmen. Not a dollar comes from the state general fund. Not a dime is collected by taxes. Every cent expended for the protection and propagation of wild life by the department comes from license fees, the sale of confiscated guns and furs, or from fines collected following law violations. Our battery of 14 fish hatcheries and five spawn-taking stations must be maintained. The state game farm at Warm Springs, the warm water pond cultural station at Miles City, the construction of additional rearing ponds and the building of dams and dykes to create nesting grounds for migratory waterfowl, the installation of fish wheels, and countless other important measures must be given attention. Sportsmen must realize this can not be done under the present fee for sober consideration of facts presented by figures show that this work can not be maintained on the basis of a $2 license. Sportsmen have been paying $2 each for sowing the crop and expending more than four million dollars for the reaping. Yet this wild life crop has a commercial and recreational value to Montana reaching far into the millions. It is a state asset that brings visitors and investors who expend millions annually. Its value in health and happiness is untold. Banish the wild life from forest and stream and what have we left?

Sportsmen of eastern states are frantic. They have watched their wild life fade and disappear. They are now setting aside vast sums in a last-minute effort to bring it back by artificial means. While a goodly portion of Montana's fish and game remains because of conscientious protection, propagation and restocking, we must meet the emergency and act before civilization takes its toll. We should not dig too deep into our supply of wild life without making adequate provisions for replacing it.

With more adequate funds made available through increasing the resident license fee, the department will be enabled to continue its work of conservation and enlarge upon the program that is now cramped and handicapped. In "planning for the future" there are many things the Commission would like to be doing and which should be done for the sportsmen, but which we are unable to do on our present income. We should plant larger fish. At the present time fingerlings are planted in the upper waters of feeder streams when they are two to three inches in length. If funds are provided so that sufficient feed may be purchased, they should be retained in nursery and rearing ponds until they are six to seven inches in length before liberation. Game fish are cannibals. They are

eternally feeding upon one another, and other natural enemies take their toll. The little fellows have but little chance. If protected until they attain a larger size their opportunities for surviving are greatly increased and much better results will be obtained.

A comprehensive survey of the trout waters of the state, making note of likely places for liberating young fish, should he made so that an adequate check may be kept on conditions and the results of restocking.

During the years in which our fish hatcheries have been operated it has been necessary to call upon members of clubs of sportsmen to assist in planting fish. Because of the inexperienced manner in which cans of fingerlings have in some cases been dumped into unsuited waters or waters of improper temperature, heavy loss has been sustained. Hence funds should be made available so that trained men in the employ of the department who accompany the oxygen-equipped fish trucks shall be entrusted with the planting of fingerlings.

The rearing pond construction program must be enlarged. Constant calls are being made by organizations throughout the state for financial cooperation in the construction and care of rearing ponds where little fish may be fed until they are of proper size for release. On some streams it is impossible to find natural sites and artificial ponds must be built. At the present time we have a large number of these ponds scattered throughout the state. To become effective, each must be watched and checked, and in many instances the fish must be fed, so that proper fish resnlts may be attained.

In many of the isolated lakes and streams it is impossible to liberate fingerlings, but in these places it is possible to plant eyed eggs, if handled by experienced men. The eggs prior to the eyeing stage become somewhat tougher and can be transported to lakes and streams where they will hatch under natural conditions. By being able to do this much more fishing water can be added to that which we now have.

The problem of saving game fish from death in irrigating ditches is one of the most puzzling confronting the department. Millions of trout go up our creeks and rivers to spawn and on their return from spawning grounds are shifted into irrigating ditches and canals carrying water to the fields. More fish are lost in irrigating ditches each year than are legally taken by fishermen on trout streams with pole, line and fly. The installation of fish screens and wheels at the mouths of these ditches and canals is mandatory if we wish to save our game fish supply. A fairly successful, workable wheel has now been discovered, but it will take huge sums of money to install it in each irrigating ditch of the state and thereby save this terrible loss of fish to the angler.

Montana has an area of more than 90,000,000 acres — a vast domain into which several eastern states might be placed and lost—yet we have but 27 game wardens to patrol this great area. Law violations are increasing in direct ratio to the increased demands for fishing and hunting privileges and we must have more game wardens to protect what we have left. If the fish and game illegally taken in this state were left for propagation purposes the supply would be greatly increased.

Eastern states are buying up little patches of cover here and there to afford shelter and feed for upland game birds during the winter. They are likewise purchasing timbered and wooded areas and setting them aside as game preserves. This policy should be encouraged in Montana. We have already acquired a strip of shore line on Red Rock Lake for future public shooting because of the fact that private hunting clubs are acquiring desirable tracts and shutting out the ordinary fellow who purchases a hunting license. More public shooting grounds should be obtained.

With the destruction of forests and the disappearance of cover, each year brings its game feeding problems. It will be but a short time until hay will have to be purchased for deer and elk and grain distributed to prevent our game birds from starving and freezing during extreme cold weather.

The planting of duck food is another matter to which immediate attention should be given. The department has already expended several thousands of dollars in planting duck food in many Montana bodies of water but we have but started the work because of the shortage of funds. Migratory waterfowl will not remain where food is not abundant. In addition to this work the building of artificial dams and dykes to impound flood waters in natural lakes is necessary to preserve the ducks, geese and other shore game birds. Dams have been constructed for this purpose at Red Rock and Fox Lakes and others are proposed in eastern Montana if additional funds are made available.

Biological research work of the department should be continued. During the biennium we have completed a scientific study of the waters of Flathead Lake in cooperation with professors of the University of Montana. This was the pioneer effort in the state if not in the nation and has since been adopted by other states. These scientists have made their services available to sportsmen for the purpose of solving problems of fish and game diseases, the proper food and water conditions for varieties of game fish, the plant life and natural food contained in streams and lakes of the state and other questions essential to the preservation of wild life. Because of the shortage of funds this work was of necessity halted.

The first game farm established in Montana has proven its worth in less than a year after completion of the rearing pens. The department has expended about $25,000 on the plant at Warm Springs, has six acres completely under wire and during 1930 made possible the liberation of 6,146 Chinese and Mongolian pheasants in 55 counties. The capacity has been enlarged so that more than 8,000 of these splendid game birds will be available for liberation in 1931. We need more game birds for liberation in Montana. The demand for them will always exceed the supply. The game farm at Warm Springs should he enlarged or others shonld be established in other sections of the state when adequate funds become available.

Stress should he laid upon the extermination of vermin in fields and forests where game birds are liberated or game abounds. It is useless to expend efforts to rear and liberate fine birds or protect game animals and then have them destroyed by predatory birds and animals. The department should be able to pay a suitable bounty on the most destructive of these killers. Sportsmen, farmers, boys and girls should enter into a year-around campaign to eradicate enemies of the birds and game animals, such as roving house cats, coyotes, mountain lions, crows and other vermin.

In planning for the future this is a portion of the program outlined by the State Fish and Game Commission when adequate funds are made available. These are some of the things we would like to be doing but can not do on account of lack of funds.

A glimpse at the resident license fees charged in 11 western states is interesting when compared with the $2 charged in Montana. It might be well to note also that the majority of states have adopted the split license system with deer tagging required such as is proposed in Montana. In California the fee is $2 for game and $2 for fishing; Colorado, $5 for big game and $2 for small game and fish; Idaho has the same rate as Montana; Nevada, $2.50 for game and $1.50 for fishing; New Mexico, $5 for big game, birds and fish, $4.50 for big game and birds, $4.50 for birds and fish, $3.00 for birds and $2.50 for fishing; Oregon, $5 for fish and gam,e $3 for game and $3 for fishing; Utah, $3 for hunting and fishing, $2 for game and $2 for fishing; Arizona, $1.10 for hunting and $1.10 for fishing; Washington, $7.50 state license for hunting and fishing, $5 for fishing with a county license fee of $1.50; Wyoming, $5 for fishing and hunting, $2 for game birds, $1.50 for fishing, $2.50 for elk hunting, $2.50 for deer hunting, $5 for mountain sheep and other licenses for each variety of game.

Lend a Hand

Be a friend to wild life—
They've a place in the plan
Laid out by the one
Who created mere man.
They've a right to inhabit
To eat and to live;
They've a right to protection
The law tries to give.
We can do nothing finer
As we journey through life
Than conserve natural beauty
And be a friend to wild life.

TWO YEARS of PROGRESS

By Robert H. Hill

Secretary Montana State Fish and Game Commission, State Fish and Game Warden.

R. H. Hill

WHEN an effort is made to review achievements of the State Fish and Game Commission during the 1929-1930 biennium, the attempt signals a resume of what have been perhaps the two outstanding years in the history of the department. When the Commission was created by legislative act 10 years ago, Montana was just beginning to come into prominence as a national playground. Natural advantages were magnets that attracted eastern visitors as well as Treasure State residents to woods and waters. With each succeeding year this incessant warfare, this constant whipping of streams and lakes, inroads on big game and birds of the field has continued, until later years have necessitated almost super-human efforts to keep pace with the kill. Hence, with surplus funds of the State Fish and Game Department exhausted, and with current funds at the lowest point in years because of mandatory demands for needed expenditures, the biennium has recorded achievements of which state sportsmen are justly proud, but left departmental revenues in dire need of undivided attention.

The following figures from the books of the State Treasurer show the balance in the Fish and Game Fund at the close of each calendar year since 1915:

1915	$ 20,421.77
1916	17,052.09
1917	46,185.01
1918	81,899.13
1919	94,244.02
1920	113,126.36
1921	36,234.26
1922	54,568.22
1923	29,853.77
1924	52,597.37
1925	94,753.89
1926	107,003.58
1927	82,457.44
1928	97,084.93
1929	98,504.22
1930 (Nov. 30)	29,067.34

According to statistics provided in the last inventory of fish hatcheries, spawn-taking stations and the state game farm, sportsmen of the state who provide the funds with which the department functions, have a total investment of $176,889.64. Land and land improvements are valued at $55,493.03; buildings and fixtures at $77,021.56; machinery and appliances at $21,940.97; hand tools and equipment at $15,587.58. This investment is divided among 14 state fish hatcheries, five spawn-taking stations and the state game farm at Warm Springs.

To keep pace with progress and to insure the preservation of fish and game, this investment must be maintained and increased if Montana is to retain a position of enviable esteem among residents and visitors.

Maintenance of this wild life means the maintenance of an investment that means the expenditure of millions of dollars annually in the state by tourists and residents alike. The expended funds go back into the pockets of Montana merchants, hardware dealers, owners of hotels, restaurants, theatres, transportation lines, service stations, garages, dude ranches, farmers, camp resorts, clothiers, and every line of endeavor.

In summarizing the achievements of the State Fish and Game Department during the biennium which has just closed, it is difficult to list them all because of the multitude of duties. Among the outstanding results attained, despite the financial handicap, the following may be mentioned:

First state game farm completed at Warm Springs with 392 pens covering six acres under wire, providing a capacity of 8,000 pheasants for release in 1931. Total birds released in 55 counties in 1930 reached 6,146.

Lake Francis hatchery and spawning station completed near Valier. This is regarded as the most modern rainbow trout spawn station in the nation.

Largest trout rearing ponds in the United States completed on the Big Hole River at Maiden Rock, in cooperation with Butte Anglers' Club.

Fourteen fish hatcheries operated and five spawn-taking stations maintained and enlarged, including the internationally famous spawn-taking station at the mouth of Flint Creek on Georgetown Lake.

Total of 38,321,884 game fish fingerlings reared in hatcheries and distributed in Montana streams and lakes in 1929 with 34,632,050 in 1930 to keep pace with constantly increasing inroads.

Hunting and fishing licenses placed in the hands of more than 800 dealers throughout the state for the convenience of sportsmen.

Dams completed at Red Rock Lake and Fox Lake to retain water for nesting grounds and sanctuaries for migratory waterfowl.

Scientific survey of the waters of Flathead Lake completed with reference to game fish in cooperation with the University of Montana, this being a pioneer effort in such research work in America.

Conducted a scientific survey and study of Montana elk herds and grazing problems in cooperation with federal departments.

Contributed 25 cents out of 83,388 resident licenses as well as other licenses issued in 1929 and a similar amount from licenses issued in 1930, to the biological fund maintained for paying bounties and waging war on predatory birds and animals.

Purchased Anderson rearing ponds at Emigrant and reconstructed the hatchery.

Rearing ponds completed in all parts of the state in cooperation with organizations of sportsmen.

Sincere efforts were made to enforce the fish and game laws in the state which has an area of more than 90,000,000 acres, with a staff of 27 deputy game wardens.

Completed one of the largest warm water fish pond cultural stations in the nation at Fort Keogh for the propagation of pike, bass, perch, catfish and sunfish for eastern Montana streams.

Provided hunting and fishing for thousands of tourists and investors from eastern states who expend millions in Montana annually as their summer playground.

Established and marked game preserves and sanctuaries for antelope, deer, elk, upland birds and other game.

Conducted thorough investigations by deputy wardens of agricultural areas damaged and flooded by beaver, issued 582 trapping permits in 1929 and tagged 8,153 beaver hides.

Conducted hearings throughout the state and meetings with sportsmen when

matters in controversy regarding game preserves or other matters have arisen.

Published and distributed MONTANA WILD LIFE, official monthly publication, for the dissemination of accurate information to sportsmen regarding activities of the department.

Issued permits to 1,777 Montana trappers in 1929 with the 1930 list still being issued.

Inspected grounds and waters and issued licenses to 223 fur farms which constitnte one of Montana's growing industries.

Completed the planting of duck food in pot holes, lakes and streams throughout the state, resulting in increasing the migratory waterfowl population.

After reviewing this list of achievements of the biennium, the thiuking sportsman of Montana gives a thonght to game conditions in years that have passed and a comparison of conditions confronting the department. To solve problems and cope with puzzling situations, thorough organization has been effected, with the cooperation of conservationists of the state. The game warden of a few years ago whose presence in a community was merely tolerated, has become a trustworthy friend and counsellor. Education has played an important part in this transformation.

A glimpse into the history of Montana's fish and game laws is inspiring.

Sixty-five years ago when Montana was in swaddling territorial clothes, when bronzed chevaliers squandered all the gold dust in their pokes in hurdy-gurdy hangouts, when millions were being washed out of virgin sands and no such thing was known as a bag limit on game, the first territorial legislature of Montana passed a bill which became a law on February 2, 1865. It provided that fishing tackle, consisting of a rod or pole, line and hook, should be the only way that trout sould be taken in any of the streams of the territory. The bill also prohibited the baiting of the hook with any drug or poisonous substance and the using of seines or nets.

In 1869 a closed season was placed on partridge and quail for a period of three years. Grouse, prairie chicken, pheasant and fool hen were protected from March 1 to August 15 of each year. The first protection on mountain goats, buffalo, moose, elk, deer, mountain sheep, antelope and hare was a closed season between the dates of February 1 and August 15 of each year. Under a law passed in 1876 beaver, otter, marten and fisher were protected from April 1 to October 1. Geese and ducks were protected between the dates of May 15 and August 10.

A law which became effective in 1877 prohibited the sale of game animals and birds.

Under an act approved March 14, 1895, it became unlawful for any one person to shoot or kill any bison, buffalo, quail or Chinese pheasant, or any female moose, female elk, otter or beaver, or to kill more than two bull moose, three bull elk, eight deer, eight mountain sheep, eight mountain goats, eight antelope, or one hundred grouse or prairie chickens.

In an article appearing in The Montana Record-Herald of Helena of May 29, 1895, Col. W. B. Huntley suggested that a test case be made to determine whether, during inhibited periods, lakes or streams could be lawfully exploited by sportsmen. The article, with a concluding remark from a member of a Helena sporting group, alleges that "a justice of the supreme court, an ardent, enthusiastic fisherman, will presently return from a trouting trip, and the president of the rod and gun club will proceed to the limit of an interview, with the purpose in view of obtaining a semi-judicial opinion from the highest source on the sufficiency of the game and fish law."

One of the first articles telling of convictions I found in reading old papers, was where a bunch of Indians from Canada crossed the line into Flathead county, June 10, 1895, and killed three deer. Officers arrested the Indians who did the killing and took them to Kalispell, where they were fined $222.15.

In 1901 a law was passed requiring non-residents, who were not taxpayers of the state, to procure hunting licenses to kill large or small game. The fee for the big game license was $25 and the fee for the small game license was $15.

The bill requiring male residents to have a license for fishing or hunting in Montana became a law in March, 1905, without the approval of the governor, the bill not having been returned to the house in which it originated within the time prescribed by the constitution. The fee to be collected for each license was $1. The law provided, however, that a license issued to the head of the family should include all female members of the family as well as all male members under 21 years. An act approved March 7, 1907, permitted residents to fish without a license. A bill passed and approved March 9, 1909, required every person who desired to hunt or fish in Montana to have a license. In 1913 the law was amended to the effect that no female or boys under the age of 14 years were required to have a license. In 1917 the fee for a resident license was raised to $1.50, one-third of which was to be used for the propagation of game birds and animals. Females under the age of 18 years and males under the age of 14 years were not required to have a license.

In 1921 the resident license fee was increased to $2, with a provision that 25 cents out of each license fee was to be set aside as a fund to be used for the destruction of predatory animals. This fund is now called the biological survey fund.

Let's take a glimpse into more of Montana's early history regarding the Commission. In some cases it has been impossible to find names of appointees after the acts had been passed by the legislature, yet this thorough search has brought many to light and revived golden memories.

On March 14, 1895, a law was passed by the Montana legislature creating a Board of Game and Fish Commissioners, said board to be composed of three members, appointed by the governor. One member was to serve until February, 1896; one until February, 1897, and one until February, 1898. The three appointed members were, immediately upon their appointment, to assemble at the state capitol and, by lot, decide among themselves as to their respective terms of office.

This same law provided that it should be the duty of the Board of Game and Fish Commissioners to secure, through their agents and subordinates, the enforcement of all the laws of the state pertaining to the preservation, propagation and protection of the game and fish of the state. They were to appoint some resident of the state as State Game Warden, whose duties it would be to act as secretary and business agent of the board. The appointed Game Warden was to hold office for a period of two years; and his compensation was to be fixed by the board, with the stipulation that in no case should it exceed the amount remitted to the state treasury by the collections of fines, which was one-half the fines collected for violations of the fish and game laws.

In this same law the appointments of deputy state game wardens was made possible. Upon petition made to county commissioners throughout the state, from not less than one hundred resident taxpayers of that county, requesting the appointment of a game and fish warden for the county, the Commissioners were compelled to appoint a deputy warden for the county, his compensation to not exceed $100 per month and one-half the fines imposed and collected through him in all prosecutions under the game and fish laws of Montana. I find that, out of

(Please turn to page twenty-four)

Mostly Legs

This Baby Moose became the pet of its captors early in its checkered career. It was bottle-reared and is now sleek and fat in the park at Anaconda.

Nation Watches Montana Grayling

J. L. Kelly
Member State
Fish and Game
Commission

ANGLERS of America, fortunate enough to have cast a fly for Thymallus Montanus, or the Montana grayling, are keenly interested in efforts of the State Fish and Game Department to maintain the supply of this royal member of the piscatorial family. The grayling is particnlarly adapted to Montana waters and is found only in Alaska and certain Michigan waters, outside the brooks and lakes of the Treasure State. Efforts are constantly being put forth by fish culturists of other states but results have been problematical. Montana grayling eggs have been shipped during the last year to the Steinhart aquarium at San Francisco which received 75,000; the California game and fish commission, which received 116,000, and to LaCrosse, Wis., where 72,000 were consigned. Exchanges of game fish eggs or birds were made in each case.

Grayling eggs are incubated at the Anaconda and Somers hatcheries which are equipped with the grayling or whitefish glass jar batteries. Batteries have also been installed at the cooperative hatcheries of the Bureau of Fisheries at Glacier Park and McAllister stations and at the Butte Anglers' Club hatchery at Divide. All are receiving grayling eggs from the Georgetown Lake station, the largest of its kind in America.

Because of the fact that no artificial feeding has proved successful with grayling, the fry are planted while in the "yolk" stage. This gives them the advantage of being in their new home, ready to seek natural food as soon as the yolk sack is absorbed.

Grayling will not thrive in many creeks and lakes because of the lack of certain aquatic plants or animal life essential to their growth. Just what this food is has not been discovered. This we do know, however, that if a small planting of grayling fry is made in waters containing this mysterious food, the results are astounding. If a plant is made in other waters under identical conditions and no results are achieved, those waters are checked off the list.

Alvin Seale, superintendent of the Steinhart Aquariums at San Francisco, has been experimenting with grayling for the last seven years but has as yet found no food, either artificial or natural, which may be fed with any degree of success. Mr. Seale each year requests a small shipment of Montana eggs for further experimentation and it is hoped that the word will some day be received that the mystery has been solved.

Numerous attempts have been made in Montana hatcheries to feed the grayling. In some cases it has been possible to raise a few to an advanced fry stage, yet the experiment can not be called a success because the majority did not survive the tests.

Michigan, which at one time was noted for its grayling, now reports them practically extinct. Fred Westerman, superintendent of hatcheries for Michigan, came to Montana in 1926 for the express purpose of gathering data relative to the grayling. Montana eggs were shipped to Michigan in 1926-27 and planted in waters known to have been the home of Michigan grayling in past years. Other plants were made in waters where conditions corresponded favorably with those at Georgetown Lake. Mr. Westerman in a recent letter to the Montana department writes: "I fear that we must depend on Montana for grayling fishing, as apparently no results have followed the planting of these fish in Michigan streams. Our own native grayling are still maintaining themselves in the short section of the single stream in the upper peninsula where they have been fonnd for many years."

While sportsmen of the nation are looking to Montana for grayling fishing, the State Fish and Game Commission is putting forth every effort to restock streams and lakes and preserve this regal specimen. We are mindful of the task we have before us in preventing the extinction of this wonderful fish and we are doing all that is humanly possible under our financial handicap to preserve the grayling for this and future generations.

Thymallus Montanus, pride of the angling fraternity of the Treasure State, is in a bad way. His tribe is decreasing. Thymallus, the envy of sportsmen of America because of the fact that he

How Grayling Eggs Are Eyed and Hatched

THIS photograph of the battery of glass jars at the Anaconda hatchery demonstrates the manner in which grayling eggs are hatched. Under a good head of pure water running through each jar, the eggs are virtnally churned to prevent them sticking together and to avoid the formation of fungus. Trout eggs are hatched in trays under lateral streams of running water, but more care must be taken with the grayling eggs.

had for years declined to thrive elsewhere than in Montana, Alaska and parts of Michigan, has, with each succeeding year, shown a marked decrease in numbers. But "Thym," otherwise known as the Montana grayling, has during the last season demonstrated his willingness to cooperate with the department and during the last biennium 15,077,200 grayling eggs were artificially taken, hatched and distributed in Montana waters. Millions of these fingerlings were placed in Georgetown Lake, near Anaconda. It has been the first planting of grayling fingerlings necessitated in this prolific body of water since 1921, yet millions of game fish eggs have been taken at the mouth of Flint Creek, flowing into the lake.

Georgetown Lake for years has been the supply station from which grayling eggs have been taken. The eggs have been placed in hatcheries after the fish have been trapped and stripped artificially, while running up Flint Creek to spawn.

Records of the Fish and Game Department show that in 1921 Georgetown Lake was so choked with grayling that it was necessary to strip but a small fraction of the spawning fish to secure number of eggs wanted. At that time the restocking was stopped until normalcy was restored. Constant inroads being made on game fish in streams of the state is likewise reflected in the growth of fishing on Georgetown Lake, until there are now more than 200 boats on the lake, hundreds of Butte and Anaconda anglers are daily taking heavy toll and marked shortage of grayling is noted. During the 1929 spawning season experts of the department took 10,646,200 eggs and in 1930 this figure dropped to 5,064,000 because of the decreased supply.

These facts are but further demonstration of the manner in which Montana's lakes and streams are being whipped and trolled and stress the necessity for a continuation of the conservation program in which the state department is now engaged.

Figures compiled by the department show that during the last biennium, 1929-1930, a total of 72,953,934 game fish have been distributed in Montana streams, or 135 fish for every man, woman and child listed among the 537,606 in the federal census of 1930. During the last seven years the records show that 380,754,777 game fish have been produced in the state hatcheries and distributed in Montana waters. If all of these fish had survived attacks of natural enemies and escaped the lure of anglers, the figure means 708 fish for each of the persons listed in the 1930 census.

History of the propagation and distribution of the famed Montana grayling dates back to 1898—some 33 years ago—according to records of the department as compiled by Charles Healea of Butte, the first superintendent of fisheries employed in that work in Montana.

The first grayling eggs taken artificially in Montana were secured in Elk Springs Creek on the Jim Blair ranch in 1898 under the supervision of Dr. James Henshall of the Bozeman station, according to Mr. Healea. Elk Springs Creek is a tributary of the Red Rock Lakes. Little success accompanied the operations, according to Mr. Healea, until 1901, when noe lot of eggs was collected and shipped to the federal hatchery at Leadville, Colo. Tests with the grayling were constantly being made but because of the peculiar habits of Thymallus Montanus the state piscatorial experts were constantly learning something new of his idiosyncrasies. Eastern states were constantly calling for grayling eggs with which to attempt transplanting. Meanwhile the artificial egg-take in Montana was increasing, streams and lakes were being stocked and the hatcheries were running full blast producing the fingerlings.

In 1902 shipments of Montana grayling eggs were made to 19 hatcheries throughout the nation. Only two hatcheries reported success. They were at Paris, Michigan, and Wytheville, Florida. Water conditions in other states caused experiments to flunk.

Between 1902 and 1907 operations in artificial egg taking of the grayling and propagation in hatcheries were continued in Montana under the supervision of department experts with varying degrees of success and in the spring of 1908 Superintendent Healea collected approximately 1,000,000 grayling eggs at the mouth of Meadow Creek, eyed them in glass jars used for whitefish eggs, with water constantly running in and out of the jars, churning the eggs and preventing them from settling into a compact lump. These operations were conducted under the old Montana Power flume. The eggs were shipped to the Anaconda hatchery when eyed. They were hatched and 500,000 fingerlings were planted in Georgetown Lake—the first on record planted in those waters. The first eggs from this planting of fish were taken in 1911.

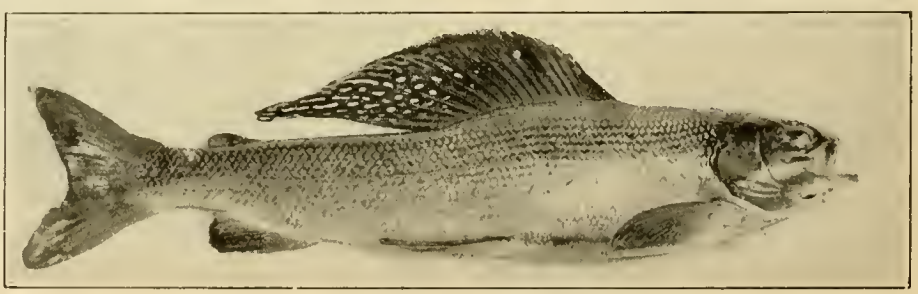
The first native trout planted in Georgetown Lake were from eggs secured through the federal hatchery at Bozeman, from Henry's Lake in Idaho, according to Mr. Healea. That was back in 1907—about 24 years ago. Later plantings were secured from Yellowstone Lake and distributed from the Bozeman station. Mr. Healea asserts that Georgetown waters have always been a natural habitat for the native trout and declares that there were thousands of them in Flint Creek before the dam was created which formed Georgetown Lake.

When Lewis and Clark made their famous exploration trip to the Pacific Northwest through Montana they found the grayling in its native habitat in this state and mentioned the fact in their journal. They alluded to it as a new variety of white trout or silver trout. In 1872 James W. Milner of the United States Fish Commission found the species in a creek tributary to the MHissouri near Camp Baker, Montana, and after describing the fish, named it Thymallus Montanus. While the grayling of Montana is closely related to the Arctic grayling there is enough difference to award each a scientific rating of its own. Scientists assert that it is probable that the Arctic grayling was the parent stock from which came the Montana and Michigan grayling and from the widely separated habitat of the three it is assumed that they were transported to their varied domain during the glacial period. This theory is strengthened by the fact that Elk Lake, one-half mile from the Montana grayling station, is abundantly inhabited by both grayling and lake trout—the latter bearing the scientific moniker of Crestivomer Namaycush—the lake trout of that variety being found in no other waters west of Lake Michigan.

Grayling eggs can not he handled in the same manner as trout eggs, during the incubating period. When first taken

How Many Eggs In a Fish?

PISCATORIAL experts of the Montana State Fish and Game Department have found the answer to the question: "How many eggs are produced annually by a game fish?" Sportsmen have asked the question countless times. To settle the argument scientific tests were made at the spawn-taking station at the mouth of Flint Creek on Georgetown Lake, the largest of its kind in the world. From 539 female native cutthroat trout a total of 984,312 eggs was taken in the test. This is an average of 1,830 eggs per trout. A similar test was made on the famed Montana grayling. Sixteen females were stripped and produced a total of 203,088 eggs, or an average of 12,683 to the grayling. Grayling eggs average 750 to 850 to the fluid ounce while the average trout eggs number 260 to 300 to the fluid ounce.



The Montana Grayling

by artificial means when the female are trapped at the spawning station, the eggs are of a rich amber color because of the presence of a large oil drop which renders them almost semi-buoyant.

In the natural state the grayling spawn along edges of a stream, depositing their eggs in the aquatic plant life rather than in the sand and gravel as do trout. The eggs adhere to the plant life until hatched. The adhesive qualities of the egg makes it imperative to incubate in jars so as to keep them in motion and prevent fungus. If they are placed on ordinary hatchery trays, touching each other, and exposed to a lateral current of water, they adhere in bunches, fungus appears and the loss is tremendous. When hatched the grayling has a small yolk sac and the fry are slender and delicate.

Montana sportsmen regard the grayling, with his lustrous royal dorsal fin, his ace of clubs markings near the head, and his elegant edible qualities, as one of Montana's prize piscatorial delicacies. He belongs particularly to the Treasure State. Anglers who are zealously watching strides made by the fisheries experts of the state department are keenly enthusiastic over efforts being made to insure restocking and preservation of Thymallus Montanus.

THE BUSY SPORTSMAN

If you want to get a favor done
  By some obliging friend,
And want a promise safe and sure
  On which you may depend,
Don't go to him who always has
  Much leisure time to plan—
But if you want a favor done
  Just ask the busy sportsman.
The man with leisure never has
  A moment he can spare;
He's always busy putting off until
  His friends are in despair.
But he whose every waking hour
  Is crowded full of work
Forgets the art of wasting time—
  He can not stop to shirk.
So when you want a favor done,
  And want it right away,
Go to the man who constantly
  Works twenty hours a day.
He'll find a moment, sure, somewhere,
  That has no other use
And fix you while the idle man
  Is framing an excuse.

The surest way to keep your husband home on Saturday night is to shoot him on Saturday afternoon.

The Boy and His Gun

LUCKY indeed is the boy who has a father who is a sportsman and who is a good enough sportsman to take his son on his hunting trips. If the dad is a real sportsman he can teach his son the proper way to handle a gun and the fundamental principles of good sportsmanship. Some boys are denied the privilege of such companionship and for these we will enumerate some of the things a boy with a gun must always remember.

You must always treat a gun as though it were loaded and cocked even though you are positive that it is not. It is always the gun they didn't think was loaded that causes hunting tragedies. Keeping this thought in mind, never point your gun at anything you wouldn't want to kill, even in fun.

If you are hunting alone, it doesn't make a great deal of difference how you carry your gun, but never, under any circumstances, take it by the end of the barrel and drag it along.

If there are other boys with you the gun must be carried so that it does not point in their direction — watch this point carefully because if you keep it pointed away from them you will not be likely to shoot them accidentally. It is much better to go hunting with only one other boy than with a crowd. It is safer and your opportunities of getting game are much better.

Be careful not to get mud, snow or any foreign substance in your gun barrel. If you think such a thing may have happened, break your gun at once and see that the barrel is clear. If it shouldn't be, and the gun should be discharged, the barrel will blow up, not only ruining the gun, but also it might cause a serious accident to yourself or any one standing nearby.

Going through or over fences with a gun is dangerous unless extreme care is used. The gun should be pushed through the fence, muzzle first, and laid down on the ground before the hunter attempts to go through himself—never go through first yourself and then drag the gun through.

A gun should never be leaned against a tree, stump, fence or building; something might brush against it, knocking it down and discharging the gun. Quite frequently such a gun has been knocked down by a dog and people injured by the resulting accidental discharge. Much the same thing applies to carrying a gun in a boat; if you must set it down, place it so the muzzle points away from you and any one else that might be with you, and over the edge of the boat, never where the accidental discharge might blow a hole through the sides or bottom of the boat.

When stopping for lunch, or when on the way home after hunting, be sure to empty the shells from barrels and chamber and still handle the gun as though you believed it to be loaded.

It is dangerous to carry a loaded gun in an automobile—many fatal accidents have resulted from failure to obey this law.

The above rules apply most particularly to shotguns, but should also be observed in the handling of rifles. With a rifle, you must also remember that the range is much further, and that you might endanger some one that is not in sight.

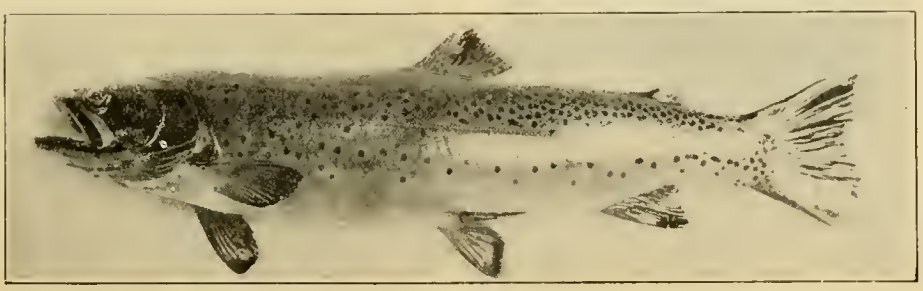
For this reason it is illegal to discharge a gun within the limits of any village, town, or city and no boy should do any hunting near a town or a dwelling place in the country. If you want to do some target shooting, go to a sand-pit or a hillside where it would be impossible for a chance or glancing shot to do any damage.

Do not forget that the killing of song birds and harmless animals at any time is against the law and that game birds and animals may only be taken during the legal open season. Better confine your hunting to target shooting than needlessly destroy wild life.

LITTLE FISHERMAN

Sitting by the river,
  Bare legs browned with tan,
Underneath an old straw hat,
  Size for any man,
What cares he, he's fishing,
  Happy little man.
"Gee! I've caught a stunner,
  Know it by the bite,
Look at all them bubbles,
  Putting up some fight.
Pull away, my heartie,
  I'll get you alright."
Bare feet firmly planted,
  Back against a tree,
Little angler triumphs,
  Lands his fish with glee.
All the little lads about,
  Congregate to see.
"Tell you he's a whopper!"
  Gasped the hero brown,
While the sweat of labor
  Trickled from his crown.
"He's a-way-up pounder,
  Nearly pulled me down."

—Outdoor America.



Another Montana Beauty

Planting Six-Inch Game Fish

By G. T. BOYD of Great Falls, Member State Fish and Game Commission

G. T Boyd

EXPERIMENTS being conducted by Montana's State Fish and Game Department in the planting of thousands of game fish which have attained a size of six inches or more are being watched with keen interest by sportsmen in the northern part of the state. Scientific study of the situation which has been made by fish culturists has been brought about by differences of opinion expressed by anglers as to the relative results attained when larger game fish fingerlings are used in the stream restocking program, as against results of planting fingerling fry. Under natural spawning conditions the eggs are deposited in the shallow upper reaches of creeks and tributary streams where the female of the species seeks solitude. After the male has passed over them, the eggs hatch and the baby trout remain in these upper waters as minnows, safe from their natural cannibalistic enemies. They venture forth on their own responsibility a little later to take their chance in quest of food.

Before the balance of nature was upset by inroads of civilization and the activity of thousands of anglers, Montana's streams were kept well stocked with game fish hatched amid natural conditions and surroundings. But with unprecedented whipping of streams came the demand for artificial spawn taking, the maintenance and operation of hatcheries and rearing ponds and the emulation of nature as nearly as possible in the planting of eyed eggs and fingerlings.

The greatest of care has been taken by fish specialists in all cases where fingerling trout have been planted. They have paid especial attention to the temperature of the water, the location of the headwaters, the eventual migration and the restocking of streams with only such fingerlings as have been suitable to those waters. Hundreds of tons of liver have been fed to fingerlings in fish hatcheries, the feeding process being necessary several times daily. The cost of this factor alone has been enormous.

Hence, by retaining fingerlings in state rearing ponds at hatcheries until they attain the length of six inches or more, naturally necessitates the continuation of the expensive feeding process. Some sportsmen feel, however, that the six-inch trout have better chances of thriving and outwitting his natural enemies than the little fellow, who must grow up amid constant danger of extermination where the survival of the fittest is the prevailing rule. Experiments have been conducted by keeping minnow trout in wire-enclosed cages sunk in running water. They have been fed regularly and a record kept of their advancement.

Hence, to enlarge upon these experiments, in a sincere effort to find definitely the better means of planting trout, the State Commission has planted more than 22,000 fish of six-inch size and greater in the Smith River and other streams during the last season. These baby trout were reared at the Emigrant hatchery.

Two shipments from the pond cultral station at Miles City were distributed in this part of the state in the Missouri River, in lakes, and along Milk River.

The fishing in the Sun River district was not as good this year as in former years, mostly due to the shutting off of the water at the new dam, and small rainfall. We hope that during the coming year the conditions will be better. The district has been well stocked.

More fish are lost by going out into irrigation ditches than are caught by fishermen. The Commission has this in mind and has done all possible to correct the situation. The United States government is helping in this matter. If the Commission had more funds to apply to solution of the problem better results could be expected.

All streams and lakes in this territory have received careful attention and have been well stocked. The territory is large, with many miles of good trout water and many lakes. It is a task to stock them all, but, owing to the splendid, careful work of men in charge of the Great Falls hatchery, this has been done.

The large new spawning station at Lake Francis was completed and put in operation this year. Several million eggs were taken and sent to hatcheries. We hope that the results will be even better the coming year; in fact, that they may rival the Georgetown station.

The question of rearing ponds has been given careful attention in this district and will receive more the coming year, as the funds of the Commission will allow. The rearing pond question is important and should receive every consideration.

The elk situation in the Highwoods is in good shape. There seems to be about 150 in that district, and no trouble from them to the ranches, according to the reports. Many elk have been killed in the Sun River herd this year. Most of the hunters going there have killed their elk, a better percentage this year than for several years. This was due to heavy snows driving the elk out of the high feeding grounds. Up to the present time it is hard to judge reports as to the number of elk killed, but I should say 700 is conservative. The open season on elk should be changed soon, but that is up to the state legislature.

There should be a closed season on deer along the hills in Lewis and Clark and Chouteau counties, or more wardens to patrol hills in this district, as there threatens to be killing of deer during winters. This has been going on for a number of years from Glacier Park boundary to the Dearborn River, despite efforts of the Commission to check depredations.

--An' He Was This Big

The mackinaw trout weighing 28 pounds shown above was caught by Sheriff Clarence Gilbert in Lewis Lake in Yellowstone Park. The piscatorial prize was afterward mounted by Jonas Brothers at Livingston, according to word received from Deputy Warden P. W. Nelson.

Fly Fishing In Montana Waters

By E. A. WILSON, Livingston, Member Montana State Fish and Game Commission

E. A. Wilson

FISHERMEN throughout the nation are turning their attention annually to the streams of Montana. Hundreds of anglers who take unusual pride in their casting ability, their outfit and their water wisdom in outwitting wily game fish travel thousands of miles to take advantage of the premier sport offered by dry fly fishing for rainbow in Montana's crystal waters. There's nothing quite so effective in chasing dull care away, in cleansing a feller's mind of business worries and nothing that takes him back to primitive wholesomeness, as the things that go with fly casting. Eddie Guest has well said that "a feller can't think mean things when he's fishin'."

Despite the fact that inroads being made on Montana's natural heritage by the constant whipping of streams and lakes, it is my belief that fishing in Montana is better than in former years. This fact has been made possible through constant vigilance of the State Fish and Game Commission in restocking depleted streams. Millions of trout are annually taken from the waters of the state, but other millions of fingerlings are planted annually to take the places of those which have found their way into fishermen's creels.

The planting of fish presents a scientific problem which is given but little thought by the ordinary angler. With its miles of trout waters beginning with the Yellowstone and its tributaries just west of Billings and extending through to the western boundary, north to the Canadian line, including the Madison River paradise, Montana's streams are world famous for their rainbow, native cutthroat, grayling and eastern brook trout. Then in the eastern portion of the state the streams are being stocked with warm water fish such as bass, catfish, crappies, sunfish, pike and pickerel. Then there are the famous Big Hole River, its tributaries, the Beaverhead and its tributaries, Flathead River and Lake, the Clark's Fork of the Columbia, the Big and Little Blackfoot, the countless small streams in the Helena and Gallatin Valleys, and miles of streams of lesser magnitude where anglers find their favored pools and sheltered spots. In many of these smaller brooks sportsmen find greater pleasure than in larger streams since lighter tackle may be used and their skill tested to the utmost. Montana's many lakes supplying a variety of trout fishing have been amplified by the planting of warm water fish in reservoirs in eastern Montana, while thousands of salmon have been released in landlocked lakes where trout waters are distant.

Montana has two of the five native grayling streams of the continent in the Madison and Smith Rivers. To the true angler the catching of grayling with its attendant care and skill affords supreme delight since their strike is light and extreme care is required in landing them safely. The grayling has a small tender mouth and frequents only those waters where its peculiar natural food abounds.

The ardent angler knows that fly fishing has an appeal that distances the use of bait or a troll line. To the angler whose love of fly casting has whetted his desires to such a stage as to be something of a connoisseur, the barbless hook and the small dry fly afford the greatest kick.

Fishing up-stream affords a greater thrill than casting down-stream. This method of course is not successful on the larger waters, although I have used this method with varying degrees of success on the Yellowstone River. It is laborious and I would hesitate to say it is generally successful. Fish head up-stream, hence on down-stream fishing the wily trout have an opportunity to see the flies and give them the once over several times, whereas upstream fishing affords them but one opportunity. On off days when the trout are not striking well, it might be a good scheme to try the system even on larger waters.

The task of planting fingerlings in the upper reaches of tributary streams is one of the important problems if we are to retain our position of prominence among anglers. At the present time the State Fish and Game Department must depend upon the cooperation of members of sportsmen's organizations of the state to aid in transporting cans of fingerlings into these waters. When adequate funds are made available, the state department should plant all the fingerlings produced in the 14 state hatcheries rather than leave the work to enthusiastic sportsmen who, nevertheless, are not trained in the work. Men whose vocation calls for knowledge of proper conditions, proper temperature and proper planting should be entrusted with this important duty. Employees of the Forest Service have been of vast assistance in this work on streams within the forest boundaries.

The problem of placing adequate screens or wheels at the entrance to irrigating ditches to save the millions of fish lost annually is one in which the department is now engaged. Up to this time but little success has attended experiments with fish wheels, but we believe a solution is now imminent. The work is expensive, yet when measured in the value of the fish lost, it would seem a profitable investment from the standpoint of conscientious conservation.

A Wonderful Bird

Some wag is responsible for the jingle that lilts along something like this: "A wonderful bird is the pelican, his beak will hold more than his belican—" and such like. Here's a picture that requires explanation. Boys and girls who are nature students must not believe stories of jokesters who insist that this is the meadow lark, the state bird. It is none other than a baby pelican who has lots of room to grow before he becomes a fish hound.

FOXY MR. PARSON

In Albuquerque, N. M., a pastor found his Sunday morning attendance was getting smaller each week. He discovered duck hunting was drawing the men out in the mornings. Intent on seeing the men get spiritual guidance, the pastor holds a service for men at 4:30 a. m.

COON IN CHICKEN HOUSE

Having lost about 40 chickens that were apparently killed by a predatory animal, Preston W. Wilson of Thurlow reports that he discovered the cause when he went to his coop and saw an animal sitting on the roost. Using his flashlight he fired and dropped a 40-pound raccoon.

Red Rock Dam Saves Waterfowl

By J. S. JAMES, State Engineer of Montana

J. S. James

IN the completion of the dam at Red Rock Lakes, assuring storage of water sufficient to protect the nesting grounds and breeding areas of migratory waterfowl, Montana's State Fish and Game Commission has completed a noteworthy task in a meritorious manner. Sportsmen of the Treasure State, who realize the worth of Red Rock Lakes in the famed Centennial Valley, in the breeding of waterfowl and the fact that thousands of ducks, geese and other migratory birds hatched at these lakes scatter throughout the state in the fall, are grateful to the Commission for foresight displayed in this enterprise.

In this work at Red Rock, as well as at Fox Lake, where a dam for a similar purpose has been completed, Montana is again taking the lead in states of the Union. The drought has cut down the number of ducks. During the last summer potholes and small lakes of the state and its sister states dried up, creeks ran low and the water in rivers receded. The completion of these dams, others of which are proposed by the Montana Commission, if funds are made available, impounds flood waters to keep pace with evaporation and drainage and insures elimination of alkaline substances always present when the water becomes low. This work is in line with a general policy of full conservation and economic use of our water supplies.

Construction of the dam for regulating the water level of the Lower Red Rock Lake had its inception in the fall of 1929 when William Stussey of Butte, superintendent of power of the Montana Power Company, with William Flynn, engineer for the A. C. M. Company, were hunting. The summer was a season of subnormal rainfall, nevertheless, water records of the Montana Power Company show many years just as low and even lower. It, therefore, would recur from time to time; in fact, 1930 would have been a repetition almost as severe.

The lake level was so low that it was extremely difficult to row a boat. Many sloughs where grass, vegetation and duck feed had prevailed were dried up; in fact, an automobile was driven over places normally flooded with water. Farmers had run their mowers over large areas normally flooded and raked off the hay, greatly encroaching on what normally belongs to the waterfowl population. Nesting facilities for the following season in such areas were naturally impaired and large areas of waterfowl food-producing districts had dried up, and possibly some of it killed out. The lake water was stagnant, filthy and highly charged with alkaline content, so injurious to waterfowl. There was evidence of duck mortality which was believed to he the result of excessive alkaline water. The conditions prevailed on the entire Lower Red Rock Lake to an extent that the normal flooded area was reduced to half its original size. It seemed a crime to see perhaps the best waterfowl haven in Montana in such a deplorable state. From an engineering standpoint it appeared that its recurrence could be eliminated.

Mr. Flynn, Mr. Stussey and Colonel D. G. Stivers of Butte began discussing the feasibility of a dam, which would maintain a constant normal lake elevation in dry seasons as well as wet seasons, and thus correct this disaster. A committee of engineers consisting of State Engineer James, Flynn and Stussey made a trip early last spring during flood season to make further investigations. The state engineer at once approved the scheme and reported favorably to the Fish and Game Commission.

Plans and specifications were drawn for its construction and bids were called for early in August, work to be completed by October 1. Work was started early in September and completed by the specified date.

In the design of this dam, consideration had to be given the maintenance of a nearly constant water level under varying conditions and the elimination of possible destruction due to moving ice. The topography is such that a raise of two feet in elevation will flood large areas of meadow land. This meant that the dam had to be so constructed that during the spring flood it would not raise the lake above previous high water marks, but that after the flood had passed, a normal level could be maintained. This was accomplished by constructing the dam in the form of a submerged weir into which flash boards can be placed as may be required under varying conditions to maintain a normal level. Upon the approach of winter the flash boards are removed, permitting a free flow of ice over the dam without possible damage and pass the spring flood following without raising the elevation.

On October 15 of this year Mr. Stussey again visited the Lower Red Rock Lake, and although rainfall for the season of 1930 was subnormal, the dam had raised the water level approximately eight or ten inches to a mean normal elevation, covering the area normally covered during normal years, which otherwise would have been dry as in 1929. The dam is serving the purpose for which it was built.

The importance of this construction can not be overestimated in the assistance to propagation and maintenance of waterfowl, not only at Red Rock, but also the entire southern Montana district. A constant level of water over a large area during breeding, rearing and feeding seasons is indispensable. Vegetation and duck food of all kinds can not thrive in areas flooded one season and dried up the next. Similarly, cover for the hunter is more likely to develop under uniform conditions.

Old Man Moose

This unusual picture of a Montana bull moose after he had shed his shovel-like antlers, was taken by W. J. Bell of the United States Forest Service. Moose are not allowed to be killed in Montana.

Th' world haint gettin' no worse. We've only got better facilities.—Abe Martin.

Saving the Migratory Waterfowl

By W. K. MOORE of Billings, Member Montana State Fish and Game Commission

W. K. Moore

PROMINENT in its program for conservation of wild life in Montana, the State Fish and Game Commission is putting forth every effort to create refuges and nesting areas for migratory waterfowl, impound waters that have for years rushed away in spring freshets or evaporated and maintain lakes where ducks, geese and other web-footed game birds may raise their young and thrive. For several years the northern flight has missed many portions of the state. These ducks in winging their way from the north to the warmer southern climes have been passing us up because of the shortage of water. On some bodies of water local ducks have been plentiful and this supply has been depended upon to provide hunting for Montana sportsmen.

In full realization of these facts, the State Fish and Game Commission has constructed two outstanding dams during the last biennium. These dams are at Red Rock Lake and at Fox Lake and have been installed to test migratory waterfowl conservation. The Red Rock dam is already operating in a manner exceeding expectations of sportsmen and has been declared one of the most effective achievements of the Commission during the biennium. Ducks bred on those lakes in the Centennial Valley scatter to all parts of the state. Another similar dam is in prospect near Forsyth and if available funds are provided by sportsmen who maintain the department, in an increased hunting and license fee, other projects will be considered.

The situation at Fox Lake, in Richland county, is one of the most interesting in the state. Years ago before the Great Northern built its branch line through Lambert, Fox Lake was a large shallow pond filled with natural duck food. It dried up each summer, however, and much of the natural food was killed.

When the railway built its line through the lake a situation was created such that the lake dried up during the nesting period and little ducks by the thousands were left to die when their parent quackers deserted the dry ground in search of water.

These young ducks, unable to fly, wandered off through the sagebrush. In one instance hundreds of them waddled to a nearby farmer's well and were rescued. They were kept in captivity until large enough to kill and were then cooked and canned in fruit jars by the farmer's wife. Many ventured half a mile into the town of Lambert and were being found in back yards and in the streets. The destruction each year has been enormous and residents of Richland, Dawson and adjoining counties have been appalled at the loss.

Hence, through cooperation with Great Northern engineers and clubs of sportsmen in Richland, Dawson and other counties, the State Fish and Game Commission set about solving the problem. The lake is 58 miles north and east of Glendive and covers about 2,000 acres.

During the high water the natural food grows in prolific manner. To make the lake more attractive to waterfowl, duck food was planted and next spring will attain good proportions.

The dam has been completed connecting with the Great Northern right-of-way, in such manner that flood waters in the spring will be backed up and impounded so that the natural lake will be maintained and the duck loss eliminated.

This lake will be one of the finest shooting areas in eastern Montana as the result of the expenditure for the dam. The movement is in line with conservation measures of the Commission similar to that of placing screens or wheels in irrigation ditches to save millions of trout lost annually.

The Fox Lake project is but an example of what may be achieved throughout the state in bringing back fish and game. Additional revenue must be made available, however, to continue this program. These problems can be solved through conscientious endeavor but pessimism will contribute nothing to the preservation and upbuilding of our game supply.

Persistent doleful predictions of this class of people tend toward the conclusion that everything in the way of game has gone to the devil. Experience over years in constructive methods of game preservation has proved that the situation is far from hopeless and that many species can be preserved, increased and perpetuated.

In many instances pessimists are wrong in their premises. They persistently repeat that in primitive times the country was swarming with game, which is not true. Game was plentiful in many localities but there were other large areas where game was scarce and at times the aborigines and early settlers suffered on account of scarcity. The early records of explorers and trappers have shown that when these periods of scarcity occurred starvation was the result.

Before the settlement of our country game was usually most plentiful in those regions which afterward were cleared of forests or drained of their waters in the progress of lumbering and the development of agriculture. These changes which we call civilization, and the unrestrained orgy of commercialism which prevailed throughout the early periods of our history, account largely for the decimation of game. The wild pigeon was exterminated by commercial exploitation. The near extermination of the buffalo during the years it was hunted persistently for its hides, and the almost extinction of deer and other large game animals in timbered sections where lumber camps were supplied for years with venison and moose meat by hired hunters, were examples of this same commercial exploitation of the wild life resources of the country. Protective laws stopped the downward curve. Constructive measures have turned it upwards and many regions once almost barren of game now have a goodly supply. What is needed is optimism and intelligent work. Universal pessimism will result in their extinction.

Laughing Waters

Here's a glimpse at the beautiful Woodbine Falls of Woodbine Creek near Dean, Montana. The picture is submitted by W. K. Fletcher of the Montana Hotel of Butte.

Montana's Buck Law Brings Results

By FRED B. WILLIAMS OF BOZEMAN, Director Montana Sportsmen's Association

F. B. Williams

ENFORCEMENT of the buck law in Montana has brought about the almost miraculous restocking of great areas throughout the state where deer had disappeared for years and where hunters have regarded the territory as barren. Sportsmen of Gallatin county, who were given an open season on deer of either sex by the 1929 legislature, have, however, learned the lesson of the folly of permitting the killing of does and will not soon forget the slaughter that followed granting the request. If Montana's deer herds are to continue to thrive in the face of increased hunting and the preying of natural enemies, continued enforcement of the buck law is mandatory.

Prior to the days of the buck law the deer in Gallatin connty were getting quite scarce. Following the passage of the buck law measure by the legislature we lived under this for six years and the deer became so plentiful that at our request the legislature passed a law giving us permission to kill one deer of either esx.

That law came into effect during the open season in 1929 and we have a record of more than 800 deer being killed. This record is not complete as it only covered the southern half of the county where we were able to make a check. Without any question there must have been 1200 deer slaughtered in the 30-day open season. The percentage on the number that we know were killed was 31 per cent bucks, 47 per cent does and 22 per cent fawns.

After the results of this unusual kill our boys were immediately ready to go back to the old buck law and at our annual meeting in April, 1930, they voted 100 per cent for a closed season on does, and for the information of the Fish and Game Commission, members of which were present, our sportsmen decided that if the Commission was not permitted under the present law to let us hunt bucks during the 1930 season, to close Gallatin county to the shooting of all deer until the legislature could meet again, which, after a ruling by the attorney general, was put in force for the 1930 season. I am happy to tell you that there was not a single deer killed in the county of Gallatin this year.

The buck law was the best measure ever passed in this state. It is surprising to see the amazing increase of deer since this law was put in force. I firmly believe that if we continue under the present buck law that it will only be a short time until Montana will have more deer than any other state in the Pacific Northwest. It is our intention at the coming session to ask the legislature to place Gallatin county back where we were and where we belong.

Hunters Race Death To Save Deer

THE loss of a day's hunting, a four-mile walk, a lonely vigil, then a 32-mile race against time, and hours of careful nursing—these episodes in a battle with death, engaged in by four men, saved the life of an injured doe deer. Announced as the outstanding instance of self-sacrifice reported to officials of the American Game Protective Association in recent weeks, this fight in the interest of wild life conservation occurred in Lake county, Michigan.

Two Detroit hunters found the doe lying injured beside a wire fence, which she had apparently struck while running. One of the sportsmen stood guard for several hours to protect the doe, while the other walked four miles to Chase and telephoned Cecil Basford, conservation officer of Baldwin, 16 miles away. Basford drove as near as possible to the scene, helped carry the injured animal from the woods, and hurried with it back over the 16-mile journey. Treated at the home of Fred Bradford, the doe began to recover. When fully recovered she will be returned to the woods.

All deer are protected in that part of Michigan, and does in every county of the state.

Such stories as this indicate that sportsmen are no longer content merely to observe closed seasons and bag limits. They are aiding wild life activity instead of passively, and often enduring hardships to help game overcome handicaps of modern conditions. They are realizing that game can not be legislated back, since laws alone fail to combat game's worst perils—an overabundance of natural enemies and a shortage of food and shelter. More adequate funds are required to maintain the fight against eradication.

HEAT OUT OF EARTH

Heat that causes the hot springs and geysers in Yellowstone National Park is assumed to be the internal heat of the earth, brought to the surface through deep cracks, mostly in the form of steam.

One Reason for the Buck Deer Law

Killing Does in Gallatin County

Montana's Game in Vigilante Days

By Chief Justice L.L. Callaway
Montana Supreme Court

Lew L. Callaway

THE editor of MONTANA WILD LIFE was good enough to ask me for an article under the rather ambitious title of "Montana's Game in Vigilante Days and in 1930." He was advised that, even if I could tell a story commensurate with that title, which is doubtful to say the least, time for the purpose is not now available to me. But the idea is alluring. Some day, maybe, I shall attempt it. The following sketch is written hunter style, which implies the plentiful use of the personal pronoun, for what hunter can talk about game otherwise?

Before the discovery of gold in this region, Montana was at least the equal of any other game country in the world. Lewis and Clark told of the many kinds and great quantities of game (varying in certain localities, to be sure), which were encountered from our eastern border to the summit of the mountains between Montana and Idaho. I speak of Montana as if its present boundaries then existed.

Before they came, doubtless the Hudson's Bay trappers had explored the country and had trapped over portions of it. The American companies—Lisa's, American Fur, Missouri Fur, Rocky Mountain Fur (Jim Bridger's), and the free trappers, had trapped in the country east of the summit of the main range of the Rockies duriug several decades. No better beaver, mink, otter, fox, or wolf pelts were to be found anywhere. Beaver were depleted almost to the point of extermination, but we know how rapidly that busy animal, given even a poor chance, "comes back."

The great Indian tribes which had made this region their home for centuries had made little impression upon what we term "big game." Nor had the predacious trappers made serious inroads.

When the gold-seekers came, countless buffalo still made their annual trek from their southern to their northern feeding grounds, from Texas to Canada, and back again. During most winters considerable numbers ranged in the valleys of the Milk, Missouri, Musselshell and Yellowstone Rivers and their tributary streams. And yet, in less than thirty years the great herds were gone—the buffalo almost extinct! We all know why.

But buffalo were scarce west of the main range of the Rockies at the time of the Lewis and Clark expedition. In 1846, Father DeSmet, writing from St. Mary's Mission in the Bitter Root, in his solicitude for the Indian tribes expressed his uneasiness over the depletion of their main source of food. The buffalo had disappeared from what is now Madison county and probably from Beaverhead and Gallatin long before 1862. On my father's ranch, on the Upper Ruby, in the '70s, there were fifty, perhaps a hundred, buffalo skulls which had not felt the blood of life for at least 50 years. Indians in middle age said their fathers could not remember when the buffalo were there, but their grandfathers could.

In the latter '50s and '60s antelope, deer, elk, mountain-sheep and Rocky Mountain goat were in goodly numbers in their respective habitats throughout Montana. Moose were to be found in some places. Countless grouse and pheasants were in the mountains and along the mountain streams. This is true of the prairie chicken in the valleys, and sage-hens abounded in the rolling hills and upon the wide benchlands where the sage-brush grows.

When the prospectors struck "pay-dirt" in the summer of 1862, at Pioneer, at Bannack, and on the North Fork of the Big Hole, each party found game all about. When the great discovery at Bannack brought on a stampede, the people, in hundreds, relied for meat on the easily procurable game which ranged nearby. In April and May, 1863, the Fairweather party found quantities of game all the way from present Twin Bridges to the Yellowstone, where the Indians turned them back. For instance, Henry Edgar tells of camping on Mill Creek, above where Sheridan is now, and says that April 5th Bill Fairweather killed a mountain sheep. "Good grub," says Edgar. They were waiting for the party led by James Stuart, which, incidentally, had gone on ahead. "Nothing to do," says Edgar, "plenty of meat and lots of deer and sheep in sight. Don't want to kill them." Later on, after crossing the Madison, Edgar says, "saw plenty of elk after we crossed. Some deer and antelope." The next day, "plenty of ducks and geese." The next day, "lots of game." As the party turned back, sadly enough, from the Gallatin on the return to Bannack, and crossed to the Madison, game was still plentiful. Wanting some meat, Cover killed an elk, Fairweather and Hughes a sheep. As the party turned from the Madison westward across the Tobacco Root Mountains, which separate the Madison from the Stinking Water (Ruby), elk were found feeding about the quaking-asp groves which grow near the lakes on the top of the range; in the summer time there were plenty of wallows around these lakes. Rodgers killed an elk near the lakes and the party jerked the meat, remaining on their pleasant camping ground for a day. The next day, May 26, 1863, they saw herds of antelope on the hills which lead down to the stream they were to call Alder; on that day they made the world-famous discovery. Shortly after making camp one of the party killed an antelope but a short distance from the

On Your Way, Mister

This Black Bear, evidently afflicted with a grouch, was snapped by Bill Rush, in charge of Montana elk study, while taking most of the road and resenting intrusion upon the playground of himself and his playmate.

place where the discovery monument now stands.

Upon that day antelope ranged the hills which sloped to Alder Creek; elk were upon the lower ridges of the surrounding mountains; on the high ridges mountain sheep were plentiful; while blacktail (mule) deer were all about in the timbered mountains near the head of Alder Gulch; bear were entirely too numerous for man's comfort. Grouse were everywhere along the creek of Alder and its tributary streams, and higher up were countless numbers of that finest of mountain game birds, the blue grouse. Pheasants were found lower down along the stream. But a year later where was all this game? Gone, most of it, fallen at the roar of the shotgun or the bark of the rifle.

Conditions were similar in the country where Helena now stands.

Professor Raymer, in his recent history of Montana, speaking of the discovery of Last Chance Gulch in 1864, has this to say: "In entering the Prickly Pear Valley from the Little Blackfoot they discovered from the large amount of game that they were in a country which had not been prospected to any great extent. As they proceeded down the beautiful gulch which now contains the highway over Priest Pass to Missoula, a stately elk bounded out and stood at short range surveying the strange party which had invaded his domain. They shot the elk and camped in this canyon, then prospected for some time but found nothing worth while. Following down the gulch they descended into the valley of the Prickly Pear, and turning to the right made their preparations for a meal on the banks of Last Chance Creek.

"The valley which spread before them was a hunter's paradise. Immense droves of antelope were feeding in it and along the margin of the stream the whitetailed deer were plentiful."

The meadows near the willow copses along the Beaverhead, the Big Hole, the Ruby, and the stream into which these three merged, the Jefferson, were full of prairie chickens. It early became the custom of everybody traveling over the country to carry a shotgun in addition to his six-shooter. The road-agents sawed off the barrels of their shotguns because they intended to make use of this weapon for larger game. It was of course available for the smaller also.

The traveler need not exert himself to have prairie chicken at his meals. This condition continued until well into the late '70, although of course chickens were being thinned out to some extent. The streams, sloughs, "pot-holes" in the meadow lands along the Madison, and similar conditions existed along the three branches of the Gallatin, the Missouri and tributary streams, provided ducks and geese in unbelievable numbers. Naturally the shotgun sportsmen of the '70s became dog fanciers. As illustrative: In 1874 my father, "back east" for a visit, purchased two Llewellyn setters which he shipped by express to Virginia City. The pups cost $25 apiece. They went by rail from Decatur, Illinois, to Corinne, Utah, and thence to Virginia City by stage coach. Other men imported Irish setters, and of course there were the pointer fans. The well-known arguments respecting the superiority of these different dogs were in play. In my boyhood Virginia City was full of bird dogs. Occasionally, — often, I should say,—two or three coyotes would come to the very edge of the little city, nestling there with the mountains all about, and, looking down upon the lights, would break into their well-known song; then all the dogs in town would get into musical action. Presently, some cranky individual would buy some strychnine and the dog owners would be hunting the wretch who would poison a valuable dog, but the poisoner never was caught. Had he been, Vigilante action might have been repeated.

In 1870, after the return of the Washburn party from its exploration of what became the Yellowstone National Park, adventurous men desired to see that wonderland. In 1871 or 1872, my father, then Secretary of Montana, and three other men, with saddle horses and a pack outfit, went from Virginia City, up the Madison River, and into the Lower Geyser Basin. My father told me that while traveling through the Madison Basin, which is now covered by the waters of Hebgen Lake, his party counted 800 elk feeding. This was in early September. About 25 years later, a hunting party of which I was a member, crossed the same basin. At that time there was no large game of any kind in the basin, but high up in the surrounding hills and mountains they might be found in limited numbers.

In the Madison Basin the ducks were living in great numbers. We had so many grouse which we had bagged coming through the canyon — we had camped where Beaver Creek enters the Madison—that we did not care to kill any ducks. We did, however, creep in the timber and brush close up to the sloughs in which there were hundreds of ducks. It must have been a duck picnic-day, because there were on one slough 20 or 30 ducks with their young, which were about half grown. This was in August. The mother ducks talked to each other and chided the children just as our mothers used to chide us at picnics. Some of the little ducks, evidently bad boys, cut up pranks which displeased their mothers very much. It was about as interesting a party as I ever attended.

During my boyhood and youth, while riding the range, we never went into the Sweetwater Basin, which lies between the Ruby and Beaverhead Valleys, that we didn't see bands of antelope. Antelope and horses are great friends and frequently would be found grazing together. The antelope have been gone from the basin for thirty years, I suppose.

There is a large area of rolling hills, which are cut by deep ravines, lying between Sweetwater Creek and the Ruby River, which is called the Big Ridge. It runs well up towards the Snow Crest range of mountains. Many bands of antelope lived there in the '70s and '80s. I am told there are still about a hundred head, widely scattered over the Big Ridge, but they live a precarious life.

Only once in my life have I been permitted to see a considerable portion of Montana as it was in its primitive state. In 1886, in consequence of the increasing number of cattle in the Ruby Valley, it was determined by the cattlemen to drive their herds from the Ruby into the "Centennial" Valley for summer feeding. The cattle were driven to the headwaters of the Ruby and over the ridge into the valley of the Red Rock, "the Centennial," which before 1876 was totally uninhabited. Poindexter & Orr, the great cattle firm of Beaverhead county, concluded to pasture a considerable portion of its herds in the valley that year, and gave it the name of "Centennial," which it has borne ever since. The valley is, roughly speaking, about 50 miles in length and from 10 to 15 miles in width. The Red Rock River runs through the Centennial from east to west. At the upper end of the valley are the Red Rock Lakes. Ten years later, when the Ruby cattlemen decided to pasture

On the Alert

This splendid picture of a Montana buck mule deer was taken near Mammoth Hot Springs by Kenneth D. Swan, who is associated with the Forest Service at Missoula. It's one of nature's masterpieces.

their cattle in that valley, it was still in its wild state. Some miles below the camp established by the Ruby people were the Poindexter & Orr and the Shineberger herds, but these were separated by considerable distances. The Ruby cattle were ranged about the lower lake on either side and for some miles down the river. On the southerly side of tbe valley the main range of the Rockies rises somewhat abruptly; on the northerly side there are the rolling hills which divide the Ruby and the Red Rock, with the high Snow Crest and Tobacco Root ranges toward the north. Myself and another youth, in late August, took a load of provisions to the Centennial to supply the cow-camp there and to assist in riding herd and in the fall branding. For at least 30 miles of the journey the wagon road was a mere cow trail, and difficult to traverse with a wagon. My companion told me of the great numbers of ducks, brant, geese and swan which would be found upon the Lower Red Rock Lake, and in the river. We crossed the river at the "Lousy-spring" ford (I shall not tell you now how that ford got its name). We drove up the sluggish river on the southerly side, talking of the odd color of its waters as we observed them at the ford. Shortly, as we came in sight of the river where it broadened and harly appeared to move, I said to him, "that certainly is curious looking water," and he said, "that isn't water, it's ducks." Believe it or not, for a space that covered half an acre the water could not be seen for the wildfowl. I believe the ducks and geese along that river and upon the lakes at that time would run into the hundreds of thousands. Red Rock Lake is still a favorite duck hunting ground, but how it differs from what once it was!

At least 5,000 antelope were then ranging in the Centennial Valley. I am inclined to the belief that the antelope had congregated in tbis valley in such large numbers as a result of the constantly increasing pressure of the white man and his herds upon all sides.

At any time of the day you could see antelope, and as you rode about the widely scattered bunches of cattle, antelope were never far distant. For meat we depended upon the antelope; it is better than deer or elk, but occasionally some one would kill a deer or an elk for a change. Deer and elk were on either side of the valley in considerable numbers. When I reached camp the boys were talking of one antelope which all had been trying to kill. He had one regular prong but the other was deformed so that it resembled a bull's horn somewhat. On my first day there he was the first antelope to fall to my rifle, a .45 Sharps. He was as large as a fair-sized deer and the head is the largest one I have seen. If you think you have a larger one, bring yours to my house for comparison.

I got my antelope on the southerly side of the river; the same day on the northerly side Charley Metzel killed the largest blacktail deer any of us ever heard of. He had "antlers like a sagebrush." The accompanying photograph,

A 38-Point Buck

This blacktail buck, described by Chief Justice Callaway in the accompanying article, was killed by Charley Metzel of Alder, Montana. The head is still in Mr. Metzel's possession.

kindly loaned by Mr. Metzel, of course does not show the head adequately. It has 38 points over an inch long. This head has been exhibited at the World's Fair (1893), the Louisiana Purchase Exposition (1904), at our own State Fair, and elsewhere, always winning first prize.

The following winter,—the hard winter of 1886-7,—practically all of tbese antelope perished. After that, never more than a few small bands, widely separated, ranged in the valley. Indeed, at the time of the passage of the law prohibiting the killing of antelope at any time, the antelope in Montana had come close to the point of extinction. Now in portions of the state this attractive, beautiful game animal is increasing at a gratifying rate; but it will take vigilance to preserve the species.

The destruction of deer in Madison and Beaverhead counties in the '60s and '70s was so great that about 1880 few deer conld be found. My father told me in 1895 that there were vastly more deer in that country then than were there in 1880, and I am satisfied that there are as many deer there now as there were in 1895. Of course, the counties with which I was then most familiar, Meagher, Gallatin, Madison, and Beaverhead, never did have the quantity of deer which has always existed in the Flathead region, and about Libby.

During the latter '80s and early '90s there were incredible quantities of grouse in the Castle Mountains and upon the headwaters of the North Fork of the Smith River, the North Fork of the Musselshell, the South and Lost Forks of the Judith and Sheep Creek. In 1892 I was secretary of the Smith River Rod and Gun Club and have heard Max Waterman, J. B. Phelps, and others, while at the traps, tell of the quantities of grouse to be found within ten or fifteen miles of White Sulphur Springs a few years earlier. It seems that the good shots about there, Waterman, Phelps, and other sportsmen, expected to kill a hundred a day each, and usually did so. These men would tell of going out upon the 15th day of August, then the first day of the season, and betting a dinner upon the one who would exceed a hundred by the largest margin. They did not seem to realize that they were game hogs of the first water. The supply seemed to be inexhaustible and none of the grouse were wasted; when the hunters got home, everybody in town had grouse.

From 1891 to 1894, to my personal knowledge, it was not difficult to kill 25 or 30 grouse in the Castle Mountains on the first day of the season. One did not have to be a very good shot to get that many; in proof of which I got bags of that size myself. The South Fork of the Smith River was a famous place for ducks and there was good shooting along the main Smith River. In the fall it was so good that one could begin shooting while still within the limits of White Sulphur Springs.

Grouse seemed plentiful all over the country with which I was familiar until about the end of the last century. In the first decade of this century sportsmen began to take alarm, and well they might, for the rapidity with which the grouse disappeared was startling. One was obliged to go afar off in order to find them in considerable numbers. The last hunting expedition upon which my party found grouse in considerable numbers was in 1904. Upon the second day of September, 1904, four of us got our limit of 20 each in less than an hour at Rattlesnake Springs, which are between Morgan and Cherry Creeks in the Madison Valley, one of the few places along the Madison where snakes are found. After we had our limit and stopped on that account, we got on our saddle horses and amused ourselves by riding over the nearby hills and shooting rattlesnakes. The grouse and rattlers seemed to be living together in peace and harmony. Charles C. Hill of Sheridan, Montana, father of our State Game Warden, was one of the party. We determined that we would not return to Rattlesnake Springs for four years. "Let's give the grouse a chance," we said. We had the notion, probably not a good one, that we were the only hunters who knew Rattlesnake Springs was such a fine place for grouse.

We never returned; probably it was just as well, as likely we should have wasted our time. It was not long until the sheep began to graze over that country. My own notion is that except in inaccessible places where the sheep do not range there will never be any more good grouse shooting. The sheep tramp out the nests; and there are people who are mean enough to say

that occasionally a herder will kill a grouse regardless of the season.

Prairie chickens, however, can be expected to thrive under present conditions if the laws are respected.

With a boy of 13 or 14, another youngster of my age, who is a member of the 1931 legislature, and I frequently killed sage-hens within a mile of the limits of Virginia City. Scores of sage-hens could be found within two miles of the city limits. I doubt if one can be found now within ten miles of those limits. In the '90s the great bench lands which lie between Smith River and the Big Belt Mountains, and in the neighborhood of Ringling, were inhabited by thousands of sage-hens. These came perilously close to extermination, but the tightening grip of the law and a vigilant game commission have prevented this. The birds are again becoming plentiful on these bench lands. In fact, some two or three years ago, on a trip to White Sulphur Springs in August, four flocks of sage-hens ran across the road in front of my car.

I am not qualified to discuss the duck situation, but anyhow, it would seem that nothing need be added to what is being said in hunting magazines respecting that problem.

Once upon a time different species of bear thrived in our mountains in no small numbers. Any discussion whether the bear should be protected or killed off will be left to others, but it is clear enough that only a comparatively few bear now exist in Montana. It is not likely that they will increase except in the parks.

I agree that the depletion of the game latterly has depended upon factors in addition to the firearm; but am convinced that the firearm was chiefly responsible for the deplorable conditions which began to come to light thirty years ago. It is believed that we may reasonably anticipate, under the present policy of the game commission, that elk and deer can be maintained at their present rather satisfactory number. Mountain sheep thrive under favorable conditions, as is shown in Glacier National Park; the same can be said of antelope. But I do not think we shall ever see the time again when there will be any satisfactory hunting, or, I might say, any general hunting at all of mountain sheep. Little more can safely be said of the antelope. After a while, possibly the bars can be let down for a short period each year in certain localities.

The depletion of prairie chicken, grouse, and pheasant has compelled the game commission to import the Chinese and the Hungarian pheasant, a movement which deserves the gratitude and support of all sportsmen. These are real game birds, but I must say, regretfully, that they are too fast for my slowing eyes.

It is a pity that the protection now given the game was not afforded thirty years ago. If recent policies had then been adopted and consistently carried forward, the sad depletion of game animal and game bird would have been arrested to a very great extent. Montana would still be hailed as the hunter's paradise. Fortunately, in a few favored regions, that can still be said.

By all means let us maintain our game preserves, and create more, temporarily at least, as wisdom shall dictate. In passing: let's keep wagons, automobiles, and airplanes out of the headwaters of the South Fork of the Flathead, and not be stingy in marking the country containing the headwaters. I am for withdrawing forever from the touch of utilitarian goodly portions of the forest primeval, and many an expanse of rolling hills painted here and there with pine tree, willow, and quaking-asp. In these sanctuaries, dedicated to wild life, there will be spots good for the soul of man—where he can feel that he is with God alone!

Montana Tags Game Fish In Tests

LORE of fairy tale days that records the decision of the mass meeting of mice to hang a bell on the cat, is being outdone by adoption of the system of tagging game fish by the State Fish and Game Department. To an angler who finds it a considerable chore to land a rainbow trout that "musta been this long," the task of catching the big fellows without doing them bodily injury, attaching the minute piece of non-corrosive metal to dorsal fin or gill-cover and then releasing the gamey piscatorial prize to continue to outwit anglers, is something of a mystery.

But that's just what is boing done in the vast program of wild life conservation and scientific study in which the State Fish and Game Department is engaged.

Under the supervision of trained experts at the spawn-taking station at Georgetown Lake and the hatchery and spawn-taking station just completed at Lake Francis, near Valier, tagging experiments are being conducted and careful records kept of each fish tagged.

At Lake Francis the non-corrosive metal tag is attached to the left gill-cover. At Georgetown the tag is pinched to the dorsal fin by means of the use of a small punch.

Each tag bears the word "Montana" and the serial number. Fishermen who catch trout or grayling bearing these tags have been requested to report the facts to the Fish and Game Department at Helena to complete the checkup. They may keep the tag as a souvenir. In making returns to the department the angler should state the date the fish was caught, where it was caught, its condition, whether fat or poor, its length (honest measure), the number on the tag and whether the tag had caused irritation or was securely fastened.

When game fish are spawning and are caught in the traps while making their way upstream, certain ones are carefully tagged and measured and the entries made in hatchery books. The tags are attached for the purpose of keeping careful check on spawning conditions.

If a tagged trout returns to the traps the following year, the fact is carefully noted with a statement regarding the condition in which the female arrives, the growth made since last the fish was credited with a return to the traps, and factors which inform the expert as contributing toward producing good or poor eggs.

This information settles the question as to whether a female trout returns to the same place to spawn every year, the zone of migration, the rate of growth and the problem as to whether or not a female will spawn on consecutive years.

One of the most interesting reports received during the recent season comes from Valier. One of the steelheads tagged at Lake Francis was carefully measured and weighed by Kenneth F. MacDonald, superintendent of fisheries. It measured 19 inches in length. Three months after it was tagged and returned to its native waters, the steelhead was caught by Attorney W. L. Bullock, well known Valier lawyer. He immediately located the metal tag on the gill-cover, weighed and measured the big fish. His measurement, according to his statement, showed the steelhead to be 22 inches in length, or a reported increase in length of three inches in three months. Facts surrounding the test provide ample Hot Stove League gossip at Valier for the remainder of the winter.

KILLS BANDED DUCK

C. T. Filson of Helena, while hunting not far from Townsend in Broadwater county, killed a mallard duck which bore a band on one leg marked A650,-276. He notified the Biological Survey headquarters at Washington, D. C., and has received a reply, which stated that the duck had been banded at Moiese, Mont., November 7, 1929, by F. H. Rose, warden of the National Bison Range.

PARK STREAMS RESTOCKED

Nearly a hundred cans carrying a quarter million trout fry transported by a cavalcade of 40 horses have been taken to a number of rivers along the southern and western borders of Glacier National Park from the Montana state hatchery at Bozeman. The restocking was exclusive of the government's plantings in the park proper.

SPORTSMEN PRACTICE "DO'S"

It looks like a sportsman is no longer the man who merely observes the "don'ts" in hunting wild life, but the man who also practices the "do's" in the conservation of wild life.

The Northern Yellowstone Elk Herd

By W. M. RUSH, in Charge of Montana Elk Study

W. M. Rush

At about the same time that the buffalo were being practically exterminated in Montana and Wyoming, the elk herds of the plains and foothills were also nearly wiped out. The remnants of the once mighty herds of this region were forced into the mountains at an elevation several thousand feet higher than was natural for them, particularly in the winter time. Elk have adapted themselves more or less to this high range until from a plains animal they have developed into a fair type of mountain animal and have learned to paw the snow away from the grass, eat aspen and other shrubs and in various ways take care of themselves in their new environment.

The small remnants that took refuge in Yellowstone National Park multiplied under complete protection until their numbers were too great for the food available for them. The severe winter of 1911, with a snowfall of 24 inches in November (at Fort Yellowstone), forced hundreds of elk outside the park to lower elevations where the animals naturally drifted in search of food. Many hundreds of elk were slaughtered and many more succumbed to starvation. Again in 1919, when the snowfall was about 27 inches in November (at Fort Yellowstone), a heavy migration of elk took place and half or more of the herd was either killed or starved. Other severe winters caused losses on a smaller scale.

The state and national governments, recognizing the value of this large elk herd from recreational, economic and wild life conservation standpoints, took action a number of years ago to secure more adequate winter range. After several attempts to secure private funds for the purchase of lands for winter elk range, the national government made the first important move in 1917 when by presidential proclamation all government land in the winter elk range was withdrawn from entry under the public land laws and reserved for elk range.

Messrs. Cochran, Pratt and other prominent conservationists in New York became interested in 1925 and purchased about 1,000 acres of improved ranch property in the best part of the winter range, besides pledging a considerable sum of money for future purchases with the proviso that the government bear half the expense of each purchase. Largely through the efforts of the Montana Sportsmen's Association and local people, congress passed the act of May, 1926, which authorized, among other things, the expenditure by the government of $150,000 for the extension of the winter elk range. A great deal of progress has been made in acquiring ranch properties and it is now thought that the danger of the northern elk herd being reduced by starvation in any great numbers is passed.

At the annual meeting of representatives of the State Fish and Game Department, Forest Service and Park Service in Livingston, Montana, in 1927 it was decided by those present that a thorough detailed study of the elk situation in the Yellowstone Park and north into Montana should be made. It was agreed that all of the interested agencies should contribute to the expense of the project, but due to lack of funds the job was not started at that time.

In 1928 Mr. Horace M. Albright interested Mr. Thomas Cochran in the elk situation and Mr. Cochran agreed to finance the study until such time as the government and state could. Mr. Albright engaged the writer of this article for the work and he was sent to the University of California to confer with Mr. Joseph Dixon and other prominent mammalogists before beginning the work. He started on the job December 15, 1928. Mr. Cochran and the Park Service bore the expense until January 1, 1930; the Park Service and the Forest Service from January 1, 1930, to May 1, 1930. Since May 1 the State Fish and Game Department, the Forest Service and the Park Service have borne the expense jointly, with the Biological Survey furnishing technical advice and cooperation in inspecting the work.

Joseph Dixon, economic mammalogist at the University of California, who has had some twenty-seven years' experience in making wild life studies, and the writer worked up an outline for guidance in making the elk study. Besides the practical things to be studied, a complete life history of the elk was included in the outline. Some of the important things to determine from a management standpoint are:

The number of elk by sexes and age classes in the northern Yellowstone herd.

Rate of increase or decrease.

Amount and types of forage required for the herd.

Diseases that elk are susceptible to.

Relation of elk to deer, moose, buffalo and other grazing animals, both wild and domestic.

Relation to predatory animals.

Effect of feeding hay on normal habits of elk.

Drift of elk to other areas and extension to new territory heretofore unoccupied by elk.

Causes of migration, both seasonal and permanent.

Value of elk both from a recreational and a meat viewpoint.

Possibilities of improvement of existing range through artificial reseeding of heavily grazed areas.

With a small herd of elk on a small area the task of securing this information would be relatively simple but with a herd of 10,000 or more grazing over an area in excess of 3,000,000 acres the job is not so easy. The job of counting elk is a difficult one. Last winter a part of the northern Yellowstone herd was counted four times. The smallest total was 7,303 and the largest 8,307, a difference of 13.8 per cent, which is not excessive considering the type of country the elk were occupying, the weather conditions and the mode of travel the men making the counts were limited to.

To arrive at the proportion of ages and sexes hundreds of small bands are counted at all seasons of the year and a total made of each age and sex from these, which gives a fair proportion for the herd. Ages can be determined into calves, yearlings and adults. The rate of increase or decrease can be gotten from the yearly counts.

A well balanced wild life population is desirable in a national park or wilderness area. That is, there should be some game animals such as elk, deer, moose, sheep and bear; some predators such as wolves, mountain lions and bears; plenty of fur bearers; small mammals such as squirrels, mice and chipmunks; birds, etc. There should be outside of the parks a surplus of each species for the hunter and trapper. The numbers of each species should be so controlled that no one species will increase to such limits that other species are deprived of food.

For instance, coyotes may be so depleted in numbers on an area that gophers and mice become abundant enough to destroy the range for elk, deer and sheep. On the other hand, coyotes can become numerous enough to make serious inroads on the calf crop of elk and deer. Bears, particularly the grizzlies in the spring, kill some elk, both adults and young, and probably kill other species of game animals. Bears, however, afford real hunting and, as bear meat is more or less palatable, can be classed as a game animal.

Our largest North American cat, the mountain lion, should not be completely exterminated. While it is the most destructive predator in this country (next to man), there is plenty of room for a few of them in our wilderness areas and the species should not be allowed

to become extinct just to provide more game animals for human use.

The proper balance between game animals and domestic animals must be maintained over a large area such as the State of Montana. Game enthusiasts and stockmen have much in common and should give each other the closest cooperation.

As a rule domestic stock and game animals should not use the same area because of the liability of spread of disease from one to the other, and because of the liability of overgrazing of the range.

Disease in wild animals is a phase of game study work on which little has been done. To find a sick wild animal and watch it closely for several days is next to impossible, to say nothing of looking into its mouth, taking its temperature, taking blood for examination or the many other things necessary in running down what may be a disease that is unknown to veterinary science. About all we have done is blunder along until a disease becomes epizootic and large losses occur in our game animals before we discover the nature and cause of the disease.

Our elk study contemplates a thorough investigation into the feeding of hay to elk. The buffalo herd in Yellowstone Park has been built up to more than a thousand head and fed hay every winter. Some serious losses have occurred from disease in the buffalo herd that fortunately can be controlled by vaccination. With the buffalo it is desirable that they become partially domesticated as it is necessary to corral them several times a year for various purposes. It is different with the elk. They leave the park in the fall and are killed for meat by hunters. It is not desirable to tame them in any degree. In fact it would be better if the elk were more adept in evading the hunters' rifles. The hunter does not now get the benefit of an outing and a real hunt that should go with the killing of a big game animal.

The present method of killing elk in the Gardiner region is far from satisfactory. There is absolutely no hunting or sportsmanship connected with it and is without a parallel in the civilized world. The elk leave the park in bunches, many times are cut off from retreat back to the park and are slaughtered by men who perhaps have not walked a half-mile from their autos. (On the morning of November 26, the writer saw a man shoot a bull elk from the road. The elk stood perfectly still on the sky-line well within 150 yards, the seventh shot from the man's rifle hitting the animal in the belly. This was less than one-half mile from the center of Gardiner.) Many instances could be cited to show how the killing of elk in this region has degenerated from elk hunting in the mountains, where a single elk is tracked down and shot, to our present pot-shooting, meat-getting system.

The remedy for this is not as simple as it may seem. The surplus of elk must be disposed of some way or their food supply becomes depleted. Killing by hunters seems to be the most desirable means of utilizing the increase. Because of the fact that the elk leave the park along a narrow strip on both sides of the Yellowstone River they are usually in bunches of a few head to one hundred or more. It has been proposed that another line be drawn away from the auto roads and that shooting be restricted to Saturday, Sunday, Tuesday and Thursday of each week. This seems to be a good plan.

Much of the winter range has been overgrazed by domestic stock in the past and is at present of low forage producing power. Through purchase of ranches and restriction of grazing privileges more than 90 per cent of the former number of domestic cattle and horses have been eliminated from the elks' winter range. As fast as funds become available more ranches will be bought. In addition to providing more acreage in the winter range, efforts are being made to improve the existing acreage through seeding of pasture grasses, irrigation of small areas of pasture and reseeding of overgrazed areas. Some parts of the range can be made to produce 50 to 100 per cent more forage than is being grown at present, with but comparatively little cost. The possibility of eliminating foxtail and other harmful grasses from the range is also being studied.

The problem of influencing the movements of elk on different parts of the summer and winter range is one which, if it could be solved, would be of great importance in relieving overgrazed areas in the winter and perhaps provide a means for better distribution of the elk on the hunting areas.

The question of mineral deficiency in the forage plants of the high mountainous regions of the country used by elk has long been discussed. Under natural conditions, before the plains and foothills were taken up for domestic stock use, wild grazing animals could select on their wide range areas and plants which were best suited to them. In the mountains they are forced to eat what they can get. This summer, through the cooperation of Mr. Edmund Burke, chemist of the Montana Experiment Station, forage plants, soils and water were collected from a number of different parts of the elk range and a complete chemical analysis made of them. While the finished results of this work are not yet available, enough has been shown to prove that the forage plants of this region are comparatively high in those minerals the lack of which causes deficiency diseases in grazing animals.

So far as has been learned the elk suffer from but few diseases. They seem to be somewhat less susceptible to diseases than deer, mountain sheep and antelope. Lung worms are prevalent in elk but do not seem to cause a great amount of trouble. Wood ticks also heavily infest the elk some years but so far no serious losses can be ascribed to this parasite. Calf diphtheria is perhaps the disease which causes the greatest amount of trouble. Foxtail grass, if fed as hay, is a factor in aiding other diseases by producing sores in the animals' mouths, thus providing a fertile field for any disease-producing bacteria that the animal may ingest. Hemorrhagic septicemia and tuberculosis have not been found in elk. The lumpy jaw organism has never been definitely isolated but is suspected of being in the elk to some degree.

The whole subject of diseases needs further study. Detailed reports are being made on the different phases of the elk study as fast as sound conclusions can be drawn. Some of these reports have been published in MONTANA WILD LIFE. The reader is respectfully referred to the January, June, July and December, 1930, numbers for these reports.

Don't Molest Fawns

MONTANA'S Fish and Game Commission has for years been striving diligently to teach sportsmen to leave apparently "lost" fawns where they may chance to find them in the woods. These fawns are not lost and will be cared for properly by the doe deer if left alone. The splendid picture shown above was submitted to MONTANA WILD LIFE as another argument in this campaign. The fawn was found in the woods, turned over to thoughtless friends to be reared under unnatural conditions and died within a few days.

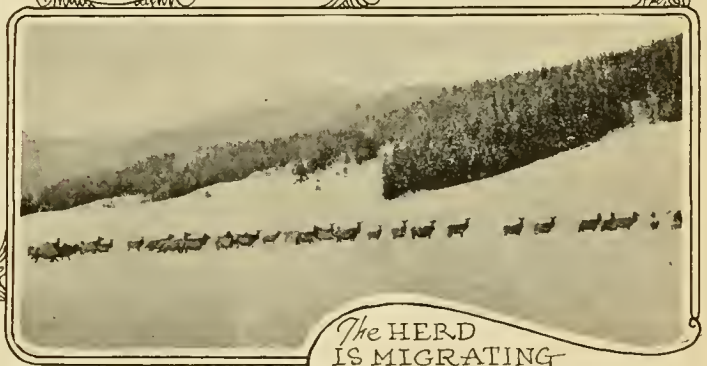
Irate Parent: "I'll teach you to make love to my daughter, sir."

Young Man: "I wish you would, old boy. I'm not making much headway."

MONARCHS of MONTANA FORESTS

READY TO RUN

BUNCH OF COW ELK



The HERD IS MIGRATING

FAT COW ELK

WINTER HERD OF ELK

BULL ELK IN WINTER

BULL ELK

A FINE BULL

BULL IN SUMMER

Two Years of Progress

(Continued from page eight)

the 24 counties at that time, only four appointed a game warden during the following five years. These counties were: Silver Bow, Gallatin, Lewis and Clark and Fergus.

Governor Rickard appointed W. B. Green of Flathead county, John F. Cowan of Silver Bow, and John O'Connor of Lewis and Clark, as the first members of the first Commission. Several changes in the personnel of the Commission were made during the following four-year period. M. J. Elrod, who is now with the state university, was appointed in place of one of the first three appointees, and he served as chairman. This Commission did not appoint a Game Warden until better than three years after the law was enacted, when R. A. Wagner was appointed to fill the office. The entire law was short lived, however, and this first Commission was abolished by repeal of the action in 1901.

In 1901 the law of 1895, providing for the appointment of a Game and Fish Commission and the appointment of county wardens, was repealed, and a law enacted providing for the appointment of a State Game and Fish Warden by the governor, the Game and Fish Warden to appoint not less than five, nor more than eight, deputy game and fish wardens throughout the state. W. F. Scott was the first State Game and Fish Warden appointed under this law of 1901, and the first warden appointed with a fixed salary. The deputy state game and fish wardens appointed by Warden Scott were: U. H. Boucher, Altyn, Teton county; Taylor B. Green, Malta, Valley county; A. E. Higgins, Missoula, Missoula county; Samuel Scott, Deer Lodge, Powell county; John H. Hall, Great Falls, Cascade county; Henry Avare, Butte, Silver Bow county; Henry Ferguson, Bozeman, Gallatin county; and Thomas T. Thompson, Miles City, Custer county. A bill, approved March 8, 1907, provided for the appointment of a Montana State Fish and Game Commission, consisting of two members and the State Game Warden, who were to be appointed by the governor to hold office for a term of four years, with the exception of one of the first appointed two members, who was to hold office for only two years. The Commissioners appointed were George E. Doll, Pleasant Valley, Flathead county, and J. C. Cotlier, Great Falls, Cascade county. Henry Avare of Butte was appointed Game Warden December 31, 1908. An act to increase the Montana Fish Commission to five members was approved February 11, 1911. The appointed members were: E. P. Mathewson of Anaconda, M. D. Baldwin of Kalispell, George E. Doll of Helena, W. M. Bickford of Missoula, and Henry Avare, State Game Warden.

In 1921 the present law was passed, creating our present Fish and Game Commission, consisting of five members, appointed by the governor. The law provides that the State Game Warden be appointed by the Fish and Game Commission. The law also states that not more than three members can belong to the same political party.

Records of the Commission show that 15 years ago—in 1915—E. P. Mathewson of the Washoe smelter of Anaconda was chairman of the board, working with such men as Nelson Story, Jr., J. L. DeHart, as secretary; Major M. D. Baldwin, Judge Bickford and Anna Dunne, the clerk employed at the munificent salary of $300 per year. Two hatcheries were then operated under the greatest of difficulties.

On December 29, 1916, Joe L. Kelly of Anaconda was appointed to succeed Mr. Mathewson as chairman. That meeting marked the first purchase by the state department of a shipment of ringnecked pheasants. Two dozen were brought from Murray, Utah, at a cost of $100 and released in Lincoln county near Eureka on the Tobacco plains.

Here are a few high points of department history that bring to memory the names and achievements of many men who are still in harness:

On March 21, 1919, J. H. Bronson was employed as superintendent of hatcheries.

On April 10, 1919, J. L. Kelly was re-elected chairman with J. L. DeHart as Secretary and Warden.

On January 5, 1920—eleven years ago—Thomas N. Marlowe of Missoula attended his first meeting. On April 20, 1921, he was named chairman of the board and has served since that date.

On February 11, 1926, E. C. Carruth and W. K. Moore became members of the Commission, the other members being Tom Marlowe, Joe Kelly and E. A. Wilson. Gilbert T. Boyd became a member April 8, 1927, when Mr. Carruth resigned, and these gentlemen now constitute the board, which is striving diligently and conscientiously to conserve Montana's wild life heritage.

It has been well said that "History is essentially biography." The history of the personnel and achievements of Montana's Fish and Game Department—YOUR department — the department which you are aiding in sustaining through moral and financial cooperation—is in like manner made up of the biographies of leaders who have given time, attention and business judgment that Montana's reputation as a fish and game paradise may be maintained.

Montana has 56 counties, some of them larger than an eastern state, yet Montana has but 27 deputy game wardens to cover these 56 counties.

Montana has an area of 90,000,000 acres to be patrolled in fish and game conservation work.

We have 33 game preserves covering 2,000,000 acres.

More than 240,000 acres are set aside for the grazing of game on national forests adjacent to the northern boundary of Yellowstone Park.

We have 14 fish hatcheries and five spawn-taking stations, the largest spawn-taking station in the world at Georgetown Lake, and 12 of these hatcheries have been established since 1920—only a decade.

Thousands of eastern tourists plan to turn the noses of their cars toward Montana next season. We extend our hospitable arms toward our eastern neighbors, but the drain on fish and game must be met. If conservation ceases, our fields and streams will become barren.

Jim, He's In Trouble

I've got a letter, parson, from my son away out West,
An' my old heart is heavy as an anvil in my breast,
To think the boy whose future I had once so proudly planned
Should wander from the path o' right and come to such an end.
I told him when he left us, only a few short years ago,
He'd miss his father's counsels an' his mother's prayers, too;
But he said the farm was hateful, and he guessed he'd have to go.
His letters came so seldom that I somehow sort o' knowed
That Jim was a-trampin' on a mighty rocky road;
But never once imagined he would bow my head in shame,
An' in the dust'd waller his ol' daddy's honored name.
He writes from out in Arizona, an' the story's mighty short,
I just can't tell his mother, it'd crush her poor ol' heart;
And so I reckoned, parson, you might break the news to her—
Jim's in the legislatur' but he doesn't say what fur.

The Wolf Pack

Is the Loch Leven Scotch or German?

By FLOYD L. SMITH, Editor Montana Wild Life

LOCH LEVEN? Is the trout so familiar to Montana anglers a product of Scotland or Germany? When the Scotchman who fills his fountain pen at the postoffice gets into a heated argument with the Scotchman who dug the Grand Canyon while searching for a nickel lost in a gopher hole, it goes without saying that things will tighten up. But when a Scotchman who loves his native burrs, thistles and heather waxes warm in defending the Montana loch leven trout as the fish that originally came from the lochs in his tight little isle, it's music that rivals the skirl o' the pipes. Such an argument is now proceeding where anglers gather in Montana and the fuss has entangled a couple of Highland laddies known throughout the state as fish culturists. W. T. Thompson, superintendent of the federal fish hatchery at Bozeman, who has often threatened to drop the "p" from "Thompson" to save ink, and Kenneth F. MacDonald, state superintendent of fisheries, who pens his name "K. F." instead of "Kenneth F." for the same thrifty purpose, are in the thick of the argument.

The moot question of popular debate is: "Resolved, That a loch leven is a German brown spotted trout." And the kilts, apparently, have the better of the negative argument.

Many letters have been interchanged. Much discussion has been brought about and research work continues. The latest batch of fresh ammunition fired into the German brown camp from the loch leven trenches comes from Superintendent Thompson at Bozeman.

In a letter addressed to the State Fish and Game Department at Helena he writes in part:

"We will always hear this loud and learned discussion regarding the loch leven and the German brown trout, just as we do about the steelhead and the rainbow. The analogy and the differences are much the same.

"From a practical fish cultural standpoint, the steelhead is a sea-run rainbow strain existent for a greater or lesser number of generations. Probably a rainbow running down to the ocean would return in the first generation as a steelhead. The California commission advised me that they did not pretend to distinguish between them though they had laws making 7 inches legal for the rainbow and about 11 for the steelhead. When I asked them how they enforced the law, they said when they found a fish in a poacher's basket under 11 inches, it was a steelhead, but anything over 7 inches in the basket of a supposedly law abiding angler was a rainbow. That is the wisdom of a Solomon for you.

"Dr. Hugh H. Smith, formerly our commissioner, once told me that the German brown, or Von Behr, to give it the name under which it was introduced into the U. S., was the ordinary fresh water brown trout of Europe, while the loch leven was the sea run variety inhabiting coastal waters for a time and ascending into loch leven and tributary waters to spawn.

"The Scotch variety took its name from the water from which the eggs were taken which were shipped to the bureau, or rather to the old U. S. fish commission, while the eggs from Germany took their name from Herr Von Behr, who was at the head of the German fisheries work at the time of the shipment.

"For a number of years, prior to my entrance into the bureau in 1897, one or both of these varieties were propagated at most of the stations, which were located in the eastern section of the country. For a time an effort was made to keep them separate, but less and less attention was paid to preserving their individual purity. Many were mixed unintentionally, while eventually they were dumped together and bred promiscuously. Fish culturists supplied either variety from the same trough or pond eventually. Before my time, say about 1890, the brown trouts went into the discard on real or alleged grounds of caninbalism, or under the belief that they were inferior to our native varieties. For years the bureau discontinued their propagation. I greatly question whether there is any strictly pure stock of either variety any place in the country, though undoubtedly strains appeared in different sections of the country which eventually differentiated from those in distant places and under different conditions. Some are vehemently claimed to be the pure German brown and others the loch leven; perhaps so? Being Scotch, I have proclaimed the brown trout of the Madison to be the loch leven. The records show that 6,700 loch leven (?) were planted in Lewis and Shoshone Lakes in 1890, and the same year 9,300 Von Behr (?) were planted in tributaries of the Nez Perce Creek, which is a Madison River tributary, while in 1889 there were 995 loch leven (?) and in 1903 an additional 9,500 loch leven (?) were planted in various places in the upper Firehole and tributary waters, so it would appear on the face of returns the loch leven have a slight majority.

"I know that many can point you the true type of loch leven or the true type of German brown, but these are the same type of fellows who can show you three or four different kinds of trout taken out of Yellowstone Lake, whereas there is only one variety, and none have been introduced from other sections.

And there you have it. When the Scotch and the Germans have argued themselves blue around the gills over this poor fish, they may eventually agree that fifty million Frenchmen can't be wrong.

Montana Mule Deer Grazing at Snow Line

HERE'S a restful, pastoral scene snapped by Kenneth D. Swan of Missoula, while hunting with his camera in the southeastern part of the state. The photographer succeeded in concealing himself, and with an ingenious device attached to the camera, secured this splendid picture of the buck, a spike buck and doe of the mule deer family, at peace with the world.

Making Movies of Montana's Game

By PAUL J. FAIR, Photographer

MONTANA'S State Fish and Game Department has authorized a modern campaign of education, intended for distribution in state and nation, portraying wild life of the state in natural haunts through the use of the motion picture camera. Several months ago this work was inaugurated at the state game farm at Warm Springs where a series of splendid "shots" were taken, which have been worked into a full reel now being shown in Montana. Another reel has been completed at the great spawn-taking station at the mouth of Flint Creek, at Georgetown Lake, recognized as the largest institution of its kind in the world. In my travels through the state, into the fields and forests and along the trout streams I have been profoundly impressed with the great variety of wild life in Montana and the absolute necessity of protecting and propagating it, to save it from inroads being made by civilization. Pressing problems confront the State Fish and Game Department, for the automobile is crowding wild life back into the recesses of the mountains, better roads are opening up areas that have for years been almost sanctified, and high powered rifles and modern fishing tackle are taking their toll.

At the present time additional reels of motion pictures of fish and game are in preparation for release. This mass of material covers a wide range of subjects, including deer, elk, big horn sheep, moose, bison, waterfowl, upland game birds and fish. As soon as sufficient film is secured to make well-rounded stories of the subjects the pictures will be released.

Many scenes of unusual beauty and interest have been secured. Of particular interest might be mentioned the film taken at Red Rock Lake showing the nesting of a pair of trumpeter swans, the largest, finest and rarest of all our waterfowl, and now in danger of extinction. The breeding of this great bird is now largely confined to a few lakes within the borders of Montana. It is hoped that the motion picture will go far toward arousing Montana people to a realization of their responsibilities in saving the species from the fate of the passenger pigeon and the great auk.

Motion pictures offer a unique and convincing method of portraying a subject in which a great and growing number of people have a spontaneous interest. To the hunter or the angler they offer a vicarious pleasure second only to the personal participation in his sport. To those who neither hunt nor fish the vast wonderland of the out-of-doors is unfolded, latent appreciation and stimulating interest is awakened in the wild creatures of forest and stream and in the problems which their proper management entails.

The Movie Man

Paul J. Fair

Wild life photography is beset with peculiar difficulties. This is particularly true of motion pictures. To a hunter, success means simply an approach to within reasonable shooting distance. If like methods were used with movies, nine scenes out of ten would be vanishing glimpses of birds or animals, that grow tiresome in their repetition.

Compared to a gun the camera hunter's weapon is at best cumbersome and slow of operation, especially when the high powered telephoto lenses are used.

To be of the greatest value the films should be intimate pictures of the daily lives of the birds and mammals or fish. They should tell something of the environment, of the food habits and the breeding habits and how contact with man has affected their lives and the necessity for laws or regulations that the species may be conserved and properly utilized as the object of legitimate sport.

The successful accomplishment of a project of this kind means not only a knowledge of photographic technique and of the habits of the subjects, but it also means the editing and putting together of the film, once it is secured, in a form that will tell the story and bring out desired facts.

To a state blessed with the rich wild life heritage that is Montana's, it is a wonderful opportunity for a work of the utmost value from the viewpoint of both sportsman and scientist. It is becoming increasingly evident that the solution of the problem of a continuing supply of fish and game lies on a basis of accurate scientific facts, now all too scanty.

Motion pictures will not only in themselves help to develop these facts, but in their visual presentation show them in the most interesting and convincing manner possible.

ALBINO PHEASANTS

Reports have been received from southeastern Pennsylvania that almost pure white ringnecked pheasants are being observed. At the beginning of Pennsylvania's deer problem a great many cases of albinism were reported. With the pheasants in southeastern Pennsylvania, particularly, a similar problem is fast becoming evident. Sexes are greatly unbalanced and the birds need thinning out somewhat. Constant killing of the big healthy cock birds each year is beginning to tell upon the quality of the stock and it has been thought for some time that eventually both males and females will have to be killed during the hunting season.

BLACK SALMON

The "black" or "slink" salmon of the Miramichi, which furnishes the earliest sport for impatient anglers in New Brunswick, is the original "poor fish" of song and story. To begin with, he is sadly lacking in judgment, or he would not be found where and when he is hooked by these earliest anglers. He should be out at sea with salmon of normal intelligence and energy; but instead, having been too slow to get away from the spawning beds and down stream again before freeze-up, he has passed the winter in fresh water—and here he is, thin and dull and exactly where the early fishermen expect to find him. Poor fish!—poor in the water, poor on the hook, poorest on the hot platter.

LIGHTNING KILLS 85 SPARROWS

A freak trick caused by lightning resulted in the annihilation of 85 English sparrows at Talladega, Alabama. During an electrical storm a bolt of lightning struck a large magnolia tree in the front yard of the home of Otis Parks, causing no apparent damage to the tree, but resulting in the death of the birds. Small boys who gathered up the dead sparrows and counted them declared that many had lost their heads and others' "eyes had popped out."

Game Increases on National Forests

THAT most types of big game continue to increase in the national forests is shown in the latest game census by the Forest Service, U. S. Department of Agriculture. In the last five years the estimated number of antelope in the national forests has increased 35 per cent, of black or brown bears 9 per cent, of deer 32 per cent, of elk 15 per cent, of mountain goats 18 per cent, and of mountain sheep 2 per cent, with decreases of 37 per cent in grizzlies, 86 per cent in caribou, and 15 per cent in moose. Unless more protection is afforded to the grizzly, says the Forest Service, other states will be in the class of California, where this animal is now extinct. The decrease in caribou is owing largely to the disappearance of the herd on one forest adjoining Canada, and it is assumed the herd has shifted its range to Canada. More reliable estimates account for the apparent lower number of moose, as early estimates were too high, the Forest Service believes.

The Forest Service game estimates, as of January 1, 1930, showed that Alaska had most of the 3,500 grizzlies (including Alaska brown bear) remaining in United States national forests. Montana had approximately 520, and Wyoming and Idaho more than 100 each. Idaho, Montana and Wyoming had most of the 5,150 moose. Elk were numerous in many of the national forests of the northern Rocky Mountains, 82,670 being listed, with more than 28,700 in Wyoming. National forests in North Carolina, Oklahoma, Pennsylvania, Virginia, and several other states had small herds.

There were more than 50,000 black and brown bears, the California national forests leading with 17,400. Approximately 21,050 mountain goats, 12,300 mountain sheep, and 10,200 antelope were found in western national forests. Beavers numbered approximately 106,660.

Of big game animals, deer were most numerous, a total of 802,450 being reported in national forests of 23 states and Alaska. California led with 254,000, and Alaska, Arizona, Idaho, Montana, New Mexico and Oregon had more than 50,000 each.

The Forest Service believes it is important that the national forest wild life resources have careful study, planning and administration. "The national forests," says the chief forester, "constitute the largest and best big game grounds in the country. They are maintained at public expense for the use and benefit of all the people. Unlike the private game preserves, they provide for the everyday American opportunities to enjoy sport and recreation which in European countries are restricted to the privileged few. They should be so administered as to combine a democratic system of use with scientific game propagation and management. This requires a coordination of federal and state action, based on a common purpose and a clear understanding of the problems involved. Wherever, through game production, the highest and fullest use of the national forests can be served, game management plans are needed.

"These plans are based on facts obtained through studies by the Bureau of Biological Survey and through the observations of local forest officers. The essentials are to determine the kinds of game best adapted to each individual area, the number of animals it will support, the number that may be removed each year while still maintaining adequate breeding stock, and the season when hunting may be permitted without undue disturbance or injury to the herd. Since the protective phases of game administration are governed by state laws, it is fundamental that these laws be based on the best knowledge and that they be well designed. The problems of game management are sufficiently important to employ the combined resources of both the state and federal agencies concerned, and cooperative relationships are not only desirable but imperative if the best results are to be attained."

Other than the 20 federal game preserves, 258 state game refuges are maintained, principally within national forest areas. These cover 19,652,580 acres of national forest land in more than 100 forests.

Whistling Swan or Snow Goose?

MONTANA sportsmen who are putting forth conservation efforts to protect diminishing wild life have been aroused on several occasions during the 1930 migratory waterfowl season, when word has arrived that some careless hunter has killed a whistling swan or trumpeter swan in the belief that he was shooting at a snow goose. Might as well mistake a barn for a dog house. The killing of a snow goose during the proper season is worthy of comment but when the so-called "snow goose" is conspicuous for its large size the bird is not a goose but a swan.

The whistling swan is and has been protected by federal and state law for many years, and the hunter who kills one commits a crime for which he may be penalized in either state or federal courts.

The hunter who would shoot a swan under the impression that he was shooting a snow goose should be deprived of the privilege of hunting at all; a man with such poor eyesight would be apt to shoot a turkey hen for a prairie chicken or a lamb for a jackrabbit.

There are two unmistakable points of difference in the two birds, size, and absence or presence of black in the wing plumage.

There are two forms of the snow goose, the lesser and the greater, but the difference in size is so small that it would mean nothing to the average hunter. There are also two swans, the whistling and the trumpeter, but again the difference is so small that only a skilled ornithologist would be able to distinguish between them. But between snow goose and either swan the difference in size is so great that there can be no excuse for mistaking one for the other. The average length of the snow goose is 23 inches, and the average length of the swan is 52 inches —in other words, the swan is more than twice the length of the snow goose. In a comparison which would be understood by the average hunter, the snow goose is much smaller than the average Canadian honker.

The snow goose in the adult stage is pure white with black primary wing feathers; in flight this black tip to the wing is quite conspicuous. The young may be more or less greyish-brown on wings, head, back and neck and sometimes both adult and juveniles are stained a rusty reddish-brown from contact with iron-impregnated water. The bill and feet are reddish in color.

The whistling swan is solid white overall, no black plumage an where. The juveniles may be flecked with light ashy gray and both ages may show reddish rust stains but the main point is that there is no black tip to the wings. The feet and bill are black. In appearance it is exactly like big white swans so frequently seen in public parks.

Both birds breed in the far north, the snow goose being more terrestial in its feeding habits than the swan; even now western fields are sometimes snowed under by large flocks of feeding snow geese. The whistling swan is wary, and usually settles well out in open water in large sloughs, beyond the reach of the hunter, and only comes in to shallow water to feed at night, when it is comparatively safe.

The swan is one of our most majestic birds and both Canada and the United States are doing all in their power to keep both species from extinction. It behooves hunters to render all assistance possible, both from respect for the law and a desire to prevent the extermination of any more species of dwindling birds.

Montana Fish and Game Commission

G. T. BOYD, Great Falls..*Commissioner*
JOS. L. KELLY, Anaconda..*Commissioner*
W. K. MOORE, Billings....*Commissioner*
E. A. WILSON, Livingston..*Commissioner*

THOMAS N. MARLOWE, Missoula, *Chairman*
ROBERT H. HILL, Helena, *State Fish and Game Warden, Secretary*

MONTANA WILD LIFE

The Official Publication of the State
Fish and Game Department.
Published Monthly at Helena, Montana.

FLOYD L. SMITH, Editor

Subscription Rate $1 per Year—15 Cents per Copy

Advertising Rates on Application

Copy for advertisements subject to approval of State Commission and must be in the hands of the editor at the State Capitol building, Helena, on the 15th of the month preceding publication date.

VOL. III JANUARY, 1931 NO. 8

THE BIENNIAL REPORT 1929-1930

MONTANA'S State Fish and Game Department herewith presents the biennial report of its activities and achievements for the years 1929-1930. Conservation activities of the Commission have been so numerous and widespread that but brief mention has been possible in this review. Sportsmen of the state have taken a keen interest in problems involving the welfare of fish and game and have extended their cooperation in wholesome manner. They have provided the funds with which the department has conducted its conscientious program. These funds, unfortunately, are now at the lowest point in many years and the surplus has been exhausted because of the constantly increasing demands for rearing ponds, additional hatcheries, game bird distribution, dams for the protection of nesting places for waterfowl and other almost mandatory steps. In many cases the requests of sportsmen have been laid aside of necessity because of the absence of available funds. The State Fish and Game Department can go no further with its program than is permitted by funds made possible by sportsmen. Figures in greater detail than those contained in the biennial report are available at state headquarters at the capitol at Helena. Efforts of the Commission have been put forth to aid Montana in retaining the position of prominence as a sportsmen's and tourists' playground. The drain on wild life is constantly increasing with encroachments of civilization, yet, with continued support of lovers of the out-of-doors, Montana's Commission will continue its courageous effort to maintain the natural heritage of the Treasure State for sons and daughters in generations to come.

Be sure your "principles" are not prejudices.

MONTANA SETS ANOTHER WORLD MARK

WITH the completion of the beautiful trout rearing ponds of the Butte Anglers' Club, at Maiden Rock on the Big Hole River, Montana has again attained national prominence by constructing the largest trout rearing ponds in the world. These remarkable ponds, portrayed in striking manner on the cover of this edition of MONTANA WILD LIFE by Photographer Smithers of Butte, have been made possible through cooperation of the Montana State Fish and Game Department with leaders of the Butte Anglers' Club. The scenic Maiden Rock is seen in the left background of the picture, where the Big Hole River makes a bend. It is surrounded with Indian legendry. Cooperation of the club and the Commission made possible the expenditure of $3,500, while a committee of workers from the Butte club contributed the manual labor.

There are eight of these ponds in a series or cascade arranged in a side channel of the Big Hole River at Maiden Rock. A rock-filled cribbing 700 feet long was built across the upper end of this channel and provided with a headgate, which will permit control of the amount of water going through the ponds. Each of the eight ponds has an area of about 20,000 square feet and has a stop board arrangement at the outlet to afford control of the depth of water in the pond. This year there will be a capacity for raising four million trout. It is estimated that the cost of feeding alone, when these ponds are fully stocked, will be more than $2,500 per year. It is planned to stock the ponds each year in July and August and keep the fry in the ponds and feed them throughout the rest of the year, and liberate them in the streams about the first of May of the year following. At this time the fingerlings should be from four to five inches in length, capable of taking care of themselves.

Leisure hours are the big cause of crime today. What to do with his leisure hours is Mr. American's hardest job.

TO FATHERS AND SONS

THE wish of every boy is to be a man and the regret of every man is that he is no longer a boy. The boy knows that dad has a lot of strength and wisdom that he has acquired by fending for himself out in the world; and son wishes that he had that equipment so he, too, could play a man's part. The man knows that son has a lot of fresh enthusiasm and tireless energy which youth alone may possess; and dad wishes he had that buoyancy so he could face the future with equal faith. Put son and dad together and especially in the great outdoors, which is the natural place for men and boys to be, and they will come to know each other better, grow fonder of each other, and learn much of value from each other.—Walter H. Newton, Secretary to the President.

The man who rocked the boat is now completely overshadowed by the man who leaves his camp fire burning.

STATES INCREASE HUNTING FEES

FIGURES compiled by the U. S. Department of Agriculture disclose a slight decrease in the number of hunting licenses issued in the United States in 1928-29 as compared with the previous year. This is the first time since records have been compiled that a decrease has been shown. There was, however, a small increase in the revenue accruing to states from sale of such licenses, due to the fact that license fees have been increased in some states.

The number of licenses sold and the revenue derived for all the states since 1925 have been as follows:

	Licenses Sold	Revenue
1925-26	5,332,375	$7,130,102
1926-27	5,989,795	8,187,223
1927-28	6,462,555	9,338,173
1928-29	6,428,761	9,391,412

I grieve not that ripe knowledge takes away
The charm that Nature to my childhood wore,
For, with that insight, cometh, day by day,
A greater bliss than wonder was before;
The real doth not clip the poet's wings,—
To win the secret of a weed's plain heart
Reveals some clew to spiritual things,
And stumbling guess becomes firm footed art.
—Lowell.

HARD ON FISH AND GAME

MONTANA can thank her stars that she has not been so hard hit by the drought as many of her sister states, says the Anaconda Standard in an interesting editorial. It continues: Some of them have gone just about as physically dry as New Jersey went spiritually wet. And the farmers are by no means the only sufferers. The drought, supplemented by forest fires, took a fearful toll of fish and wild life; bringing about a depletion which will be felt for years.

Birds and beasts, fish and fowl, have suffered alike from both causes. Countless numbers of animals died in forest fires, and ashes and burned timbers, falling into lakes and streams, formed a deadly lye that poisoned fish life. Lowered water levels of streams and lakes—in some cases the streams were totally dried up—left the fish dead on the hard-baked bottoms. A bulletin from the United States Bureau of Fisheries estimates the destruction of fish as "incalculable." Those who angle for sport or food will be ruefully aware of the losses for many seasons to come.

Lack of water and the excessive heat in the woods killed numberless animals throughout the country. Because of these events it is all the more imperative for all of us to devote our every effort to conserve the decimated ranks and schools of our wild life and fish. Alarming as the situation is, we can not only conserve what we have left, but we can restore the losses if the public will turn to and help their state fish and game commissions.

If thou art worn and hard beset
With sorrows, that thou wouldst forget,
If thou wouldst read a lesson that will keep
Thy heart from fainting and thy soul from sleep,
Go to the woods and hills! No tears
Dim the sweet look that Nature wears.
—Longfellow.

BIRD SANCTUARY AT GOLF COURSE

THE Montana Standard of Butte says editorially: The Lakeshore Country Club has created a bird sanctuary at the one-time pleasure resort of Lake Avoca. In the old days, birds continually attempted to pre-empt the lake and its surrounding trees and shrubbery, but, in spite of all its owners could do, hunters were there at sunrise to shoot ducks, mudhens, snipe or plover or any of the little feathered folk for whom the place seemed especially made. The sunrise bombardment terrified and chased away all song birds which would have liked to have nested and raised their broods there. The picturesque cranes and the smaller and rare American ibis and the killdeer visited there and foraged, but raised their families up the creek at safer distances. But, though sheriffs' deputies were frequently called and tried to keep the poachers away spasmodically, the feathered visitors grew fewer each year, and the aimless, heartless and brainless hunters grew more plentiful.

Last year Lake Avoca became a country club with a golf course surrounding it, and in that one season, as if by instinct, the birds began to take possession of the place. Golfers come eary and stay late; many are there shortly after sunrise, and it would be all a hunter's life was worth to attempt any shooting around the lake. The birds seem to know that golf players are harmless and friendly. Larks nest within a few feet of the greens; important robins scold noisily but fearlessly; canaries by the score flood the groves with melody, and the bluebirds exhibit not the slightest fear of man or woman. Where the cat-o-nine-tails grow majestically, parent ducks feed their young within sight of the 10th and 12th holes and during the mid-afternoons a dozen different kind of waterfowl float lazily mirrored on the glassy surface.

The word seems to have gone out to all feathered folk that they are safe on the Lakeshore golf grounds; their chances of being injured by a golf ball are relatively light. Birds pay so little attention to the players that they no longer give the fear sign or the danger call when humans come close. Next year the influx of birds will be greater. Hundreds were already hatched there this year. There are humming birds this year at Lakeshore, and maybe the giant cranes and ibis will return. The place promises to be one of the best bird sanctuaries in the state, shared fearlessly with human beings.

THE VALUES OF WILD LIFE

THE common symbol of value is the dollar mark. The dollar value of wild life can readily be seen in food furnished, in attraction to tourists, and as a stimulant to certain forms of business or trade. There are other values that the dollar mark can not express—among such values are the pleasure and recreation afforded mankind and the better citizens made by an intimate contact with nature.

That the American system of free-shooting is about to become a thing of the past is the almost unanimous opinion of leading conservationists.

In the United States the game has always been considered the property of the state, or rather of the people as contrasted to the European system which considers game as private property. The adoption of the European system in this country is incompatible with American traditions and ideals. The American system has failed to maintain an adequate supply of game—something must be done if our game supply is to be saved from extermination.

The solution as given in the national game policy, recently approved by this country's leading conservationists at the Seventeenth National Game Conference, is the adoption of a system that is somewhat of a compromise between the European and American systems. Under this policy the land owner is to be given more authority to regulate hunting on his property and encouraged to maintain a supply of game as a secondary source of revenue.

The time is fast approaching when most privately owned lands will be posted against hunting by the public. When that time comes the man who hunts must either own his own shooting ground or pay for the shooting privileges on lands of others, unless the state purchases and sets aside land as public shooting grounds, in such manner as is proposed by the Montana Fish and Game Commission, which has already acquired land on Red Rock Lakes to be held as public shooting grounds.

"They've invented antitoxins for diseases near and far,
They can take apart your body like the chassis of a car,
But there's nothing been discovered in the medicated chest
That will cure the fishing fever when it hits the human breast."

BOY SCOUTS BEFRIEND WILD LIFE

MONTANA boys who are associated with the Boy Scouts of America are recognized among outstanding friends of fish and game. Their training in woods lore, in the ethics of sportsmanship and in doing good turns has caused them to appreciate nature's heritage. Perhaps the marvelous growth of Scouting in America in the past five years may be partially attributed to the fact that 1,540,000,000 people—91 per cent of the population of the entire world—have officially endorsed and embraced the movement, and also that recent statistics disclose the fact that 75 per cent of crime in the United States is juvenile.

We are rapidly learning the much-needed lesson of preparedness, and that it is far better to prepare and prevent, rather than repair and repent, and that it is more prudent to build boys than to mend men.

Scouting has been aptly termed a "Constructive Contribution to Human Happiness." This is particularly true because it is based upon service to their fellows and to the community, in addition to being self-imposed.

The Scout motto is "Be Prepared," and its slogan, "Do a Good Turn Daily." No true happiness can come to any individual that is not based upon unselfish service. Service has been termed "the rent we pay for the space we occupy," and it is now almost universally conceded that Scouting is not only a plan for the upbuilding of boys, but THE plan.

Scouting teaches obedience and self-reliance, and builds for four-square American citizenship. Its hold on the boy lies in the fact that it is self-imposed and also because it is a positive rather than a negative program. He is told what to do, instead of what not to do. He is invited to come and do certain things, instead of being allowed to follow his natural inclination to go and do other things less helpful.

Fish and Game Attract Tourists

By A. J. BREITENSTEIN, Secretary Montana Automobile Association

A. J. Breitenstein

ONE of the biggest tourist-drawing features of Montana is the facility with which the State Fish and Game Department has been able to supply the demand for those two great sports, fishing and hunting. Within her borders the state boasts an abundance of streams well stocked with the finny tribe that so delights the adherents of Izaak Walton. We hear a great deal concerning the reasons why tourists come to Montana. These include the superb scenic possibilities, recreational advantages, historical features, accessibility to two of the greatest national parks and numerous forest reserves. But do we at home, or does the tourist stop to think that every one of these things is indissolubly linked with fish and game and the possibilities the state offers for full utilization of the two great sports connected with them?

Montana has open seasons on such big game as elk and deer; on Chinese pheasants and Hungarian partridges; migratory waterfowl, such as ducks, geese, brant, coot and others, with certain provisions and exceptions, of course, in various counties.

What we wish to emphasize in this article is the close affinity between tourist travel and fish and game attractions offered by the state and the necessity for providing the State Fish and Game Department with adequate funds to continue its vast program of conservation. Without continued protection of wild life throughout Montana and the cooperation of every citizen to uphold game laws, tourist travel would be seriously affected. The connection between the two is very apparent. It is to Montana's interest that she does not "kill the goose that lays the golden egg."

The instinct to hunt and fish has always been deeply implanted in man's nature. The fellow who has never stalked big game, hunted upland game birds or migratory waterfowl, or never cast for trout, has missed the sweetness of life. Then, too, his best appreciation of nature has come to him perhaps on some duck hunting trip when the day awakens, heralded by a marvelous sunrise.

There may be some who have a personal aversion to hunting or fishing. Whether or not this may be true, wild life will always give an added vitality to woodland scenes. What thrill is not added to a tourist's estimate of a mountain view when a shy deer leaps into sight or of a crystal stream when sportive rainbow-flecked trout jump?

From the chief executive of the country to the humblest of its citizens we are all fishermen after our own fashion, whether we go in for it in an expert manner or merely for the sake of that sort of relaxation which only a rod, old clothes, a sparkling stream and silence can give. Trout bite fast in Montana streams, whether the tourist pauses to catch a few for breakfast or makes an extended fishing trip. The aftermath, too, is pleasant for it is usually the fishing story that has first place among the anecdotes the traveler has ready for his next-door neighbor when he returns from a trip through Montana.

Dude ranches are becoming more popular each year as new ones are added to Montana's list of these resorts while old favorites draw back an influx of eastern visitors. At these places fishing and hunting facilities are always emphasized. Without them it is probable that the easterner's interest would sadly wane.

Forest reserves and the national parks in this state are assured an added quota of tourists each year because of wild life that exists and the publicity of this attraction in such districts has made the parks and reserves gain much by way of reputation. The reserves, with their thousands of acres of wooded lands, offer an ideal haven for wild life. This fact is ample incentive for the myriads of tourists who visit these regions.

Yellowstone National Park is one of the greatest wild life refuges in the country and in its 3,348 square miles of mountains and valleys roam many animals. Quiet watchers on trails may see deer, bear, elk, antelope, mountain sheep, bison and moose. This park is an excellent bird reserve. Several hundred specie live there undisturbed.

Glacier National Park is not to be outdone by Yellowstone, for it, too, boasts an abundance and variety of wild life. The tourist may often see moose in the deep forest, elk on open ridges, goats or mountain sheep on high crests and ridges. Bear and the whitetail deer often appear along trails and more abundant small mammals are found around the hotels and camps. Wild life is one of the greatest attractions in these parks for the many thousands of tourists that visit these wonderlands annually.

Fishing is unexcelled in the waters of both Yellowstone and Glacier. Back in the depths of Yellowstone's mountain fastnesses trout, whitefish and grayling prove grand sport for the tourist-fisherman. Practically all lakes and streams in Glacier that will support fish life have been stocked with rainbow, eastern brook, cutthroat and others.

Cow Elk Dies on Barbed Wire at Forest Boundary

STRANDS of barbed wire hidden in the undergrowth surrounding the forest proved fatal to this cow elk in the Sun River area. When the picture was taken, the calf was found nearby. The dead elk was found on Ford Creek, one mile below Carl Fender's dude ranch, about 17 miles southwest of Great Falls. The picture was taken by Mr. Fender.

Diseases of Game and Domestic Livestock

By DR. W. J. BUTLER, State Veterinarian of Montana

MONTANA'S game is susceptible to most of the diseases of domesticated animals of the same classification and species. In fact, disease shows no distinction between animals of the same species, be they wild or domesticated.

Most wild game are pretty hardy. They have to be to withstand the vicissitudes of nature, long drawn-out winters and a shortage of feed. In most cases it is a case of the survival of the fittest. The weaklings die early in life. Naturally this being the case the survivors are generally of a strong, hardy constitution and transmit to their offspring a strong, vigorous and hardy constitution.

Death from disease, in wild game, is generally kept at a minimum by reason of a strong constitution but more particularly by reason of lessened contact with sick animals and therefore a lessened contact with infection. Wild animals generally spread over a large area of country. When a wild animal gets sick it crawls off by itself or is driven out of the band by its more vigorous mates. In this way the band is probably saved from destruction.

In microbial diseases, that is, diseases caused by bacteria, it is the degree or mass of infection that most often determines sickness and probably death of an animal. Where an animal simply gets a very mild or minimum dose of infection it will in most cases overcome that infection and may not even show any disease condition. However, if that infection is a mass infection invariably the animal will show evidence of disease and may die.

The same conditions hold true for parasitic diseases, that is, diseases caused by internal parasites or worms as well as external parasites. If an animal grazing over a territory picks up only one or two worm eggs nothing serious is liable to happen to that animal. If the same animal happens to pick up and ingest several hundred parasite eggs then the condition may be different and very serious changes in the system of that animal may occur.

In wild animal life we find from time to time dangerous and ofttimes fatal diseases. If these animals were confined in a small lot together with other animals of the same species undoubtedly most, if not all, of the animals in the band would become diseased. We find liver flukes in many wild ruminants (a ruminant is an animal that chews its cud). These liver flukes that we find in elk and deer are the same as the ones we find in cattle and sheep. Occasionally we find scabies (caused by an external parasite) in elk and in mountain sheep, just the same as we find these parasites on cattle and on domesticated sheep.

In beaver and other water animals we find stomach worms of the same species as those we find in domesticated sheep and foxes.

We have never personally observed tuberculosis in elk or deer or any of our mountainous wild animals but we have observed tuberculosis in antelope. In fact, antelope held in captivity are very susceptible to and succumb quite rapidly to tuberculosis.

In most microbial diseases animals that are subjected to slight infection from time to time develop a natural resistance or perhaps it would be better to say a partial resistance to the disease. This resistance in many cases is hereditary and is transmitted down to the offspring. Wild animals are not subjected to continuous small doses of infection to the same extent that domestic animals are. Therefore, they are probably more susceptible to most microbial diseases than domesticated animals. This is fairly well illustrated in the case of wild animals that are held in captivity and which come in contact with infection.

We can control, to a great extent, many of the infectious diseases of livestock when they make their appearance in any of our domestic herds or bands by segregation and in some cases by vaccination. We cannot, however, apply such control measures in the case of wild animals. In the case of wild animals, that is, animals that are not under any restraint or control whatever, we must depend. upon aiding or keeping such animals away from infection. This simply means that such animals should have a wide scope of territory in which to live. If we cut down that territory and herd them into relatively small areas where they are constantly coming in contact with each other and continuously grazing over their bed grounds, naturally they are in more or less constant danger of being subjected to mass infection should any animal in that area be suffering from an infectious disease or parasitic infestation.

The survival of wild animal life depends upon their having ample area in which to graze and live and propagate. It is inhumane to permit too many of onr wild animals to graze over a limited area. In order that wild animals shall survive it is necessary that their number be kept at a reasonable figure. If they are allowed to propagate in greater number than their range area will adequately sustain it simply means that the entire wild life in that district will be subjected to privations by reason of inadequate feed supply and the danger of their being reduced or possibly exterminated by disease is greatly increased.

For economic reasons it is essential that a certain number of domesticated livestock be grazed during the summer months in our mountainous areas. The fencing and farming of our bench and bottom lands has made this practice a necessity. Personally, I am of the opinion that it is good for the mountainous regions for a reasonable number of domesticated livestock to graze on these mountain areas. This practice is one of the greatest protections we have for the preservation of our wild animal life by reason of these domesticated animals browsing off the underbrush and lessening the danger of fire. To my way of thinking the fire hazard is the greatest of all dangers that present themselves to wild animal life. Whenever we have a disastrous fire we know that the following winter will find a great number of wild animal life in that area dying, not only from direct starvation but from disease conditions that developed by reason of the animals' lowered resistance. Under ordinary conditions many of these disease conditions would be a negligible factor were the animals' resistance up to par.

Domesticated animals were once wild animals. They are what they are today simply by selectivity. They are just as likely to pick up diseases from wild auimals as wild animals are likely to pick up diseases from them. Personally, I am of the opinion that there is a negligible danger of domestic animals contaminating wild animals or vice versa, just so long as there is no dangerous outbreak of disease in these animals and just so long as the ranges or grazing areas are not overstocked. In Montana our livestock are particularly free from dangerous diseases and by reason of their browsing off the underbrush and thus lessening the fire hazard we believe that the grazing of domesticated animals in our mountainous sections is an asset to the State of Montana and of considerable value in the protection of wild animal life.

What we have said of animal life applies to wild bird life. As in animal life, we believe that the fire hazard is the greatest of all potential dangers to wild bird life. Predatory birds of course take their toll of our song and food birds but nothing as compared with a disastrous fire.

We believe in a live and let live policy. Domesticated livestock should have their grazing rights respected and at the same time grazing preserves should be set aside for our wild game life. However, it is possible to go too far in setting aside preserves and it is also possible to be more or less cruel and inhumane to our wild animal life by permitting over-populization of wild animals in such areas. Starvation is the cruelest death of all. When a district becomes over-populated then restricted weeding out of a limited number of animals should be permitted and practiced.

MONTANA'S FISH FACTORIES

By Kenneth F. MacDonald
Superintendent of Fisheries.

K. F. MacDonald

MONTANA is becoming more "fish minded" each year. This is especially true of the last ten or twelve years when, due to the change wrought during war days of 1917-18, people were tuned up to a faster life, the mode of living was changed and they were given a taste of prosperity that left an indelible impression. Industry and business likewise experienced this change and adjusted themselves to meet conditions with the result that there has been developed a trend of high-pressure production and specialization which in turn has provided more leisure and better means of enjoying it than in past years. Each season sees more people turning to the out-of-doors and to fishing. The need for this form of recreation was never more apparent with the present-day standard of work and home life. Fishing is one of the great magnets that attracts pleasure-seeking people. Love of angling is inherent in almost every normal person.

As early as 1921 the State Fish and Game Commission sensed the necessity of expansion of the fish cultural operations, and in that year launched a most ambitious program. During this ten-year period hatcheries were constructed at Great Falls, Big Timber, Missoula, Red Lodge, Libby, Polson, Ovando Lewistown, Philipsburg and the large hatchery at Hamilton, built by Marcus Daly and turned over to the state for a ten-year period. The Miles City pond cultural station was constructed and put in operation as was the rainbow spawning station at Lake Francis, near Valier. Repairs have been made at the Georgetown and Lake Ronan spawning stations and heavy plants of rainbow fingerlings made in Cliff Lake with a view of establishing a spawning station at that point where, due to warm water feeder streams, eggs may be collected during February and March. At the present time we are right in the midst of this program and much remains to be done before it can be brought to completion.

Our spawning stations are now developed to the point where it is taxing the hatcheries and equipment properly to care for the eggs and fish. There seems to be a natural tendency among fish culturists to each year try to better the production mark of the year previous. This tendency probably dates back to the days when a fish culturist's degree of success was measured by the number of fish planted. With all due respect to these pioneers, we are now more concerned with such factors as increasing the average size of the fish planted, with increasing the efficiency of our planting crews to the end that fish may be intelligently planted in waters conducive to their future growth and development than with increasing the number of fish planted. With our present program it is possible to carry but one or two permanent employees at each of our year-around hatcheries and we must resort to temporary help during the busy season. Little can be accomplished toward any advancement or improvements so long as this condition prevails.

Heretofore this has been necessary because of lack of funds. We are in hopes that this situation will be remedied in the near future, permitting us to build up an organization at each hatchery able to handle the work in that district along intelligent lines, including the important work of doing all distribution.

Under the present arrangement the regular personnel has no time in which to get out on the streams and see matters as do the anglers. They must depend wholly upon hearsay. If we could have a permanent personnel of from two to four men at each station, depending upon the size of the station and conditions, I feel satisfied that we could improve conditions one hundred per cent. These men could make a survey of streams and lakes in their district, gather such data as to the volume and depth of water in streams, the area and average depth of water in the lakes, fluctuation of water levels, character of bottoms, aquatic vegetation and animal life present, the abundance of same, fish living in that water, degree fished, irrigating ditches and the natural enemies,

Distribution Report of All Fish Hatcheries for 1929

	Native Cutthroat	Rainbow	Eastern Brook	Loch Leven	Chinook Salmon	Grayling	L. Superior Bass	Whitefish	Sunfish Crappie		Perch	Total
Anaconda	2,633,404	726,000	48,000		49,600	7,250,000						10,707,004
Somers	1,480,994	1,781,200			100,623	1,206,200	228,000					4,797,017
Hamilton	1,970,000	152,000										2,122,000
Libby	989,597	507,920										1,497,517
Ovando	986,064											986,064
Station Creek	611,000	528,200			19,000			999,000				2,157,200
Missoula	770,000	246,000			98,400							1,114,400
Rock Creek	950,000											950,000
Big Timber	1,983,000	875,984	166,344	994,600	36,720	40,000						4,096,648
Emigrant	791,200	823,676	342,572		47,432							2,004,880
Great Falls	991,742	495,000	178,000	661,767	39,000							2,365,509
Lewistown	1,045,720	500,950										1,546,670
Red Lodge	215,000											215,000
Miles City Pond							57,000		80,750	10,275	100	148,475
Cooperative Hatcheries:												
McAllister (Government)	545,500					1,150,000						1,695,500
Divide (Butte Anglers)	800,000	118,000				1,000,000						1,918,000
Total	16,763,221	6,754,930	734,916	1,656,367	390,775	10,646,200	285,000	999,000	80,750	10,275	100	38,321,884

temperature at different times of the year and any matters pertaining to fish cultural work.

We are installing an indexed card system upon which will be entered all information relative to each body of water. We have already started upon this work but it will be on a small scale for the present because of the shortage of help. If we had this data, with an intelligent interpretation of the facts, it would bring out many changes for the betterment of the work. It would bring out cases where some waters are not adapted to a certain species of fish, other waters wholly unfit for fish life, and would give us an established program to follow in our distribution work.

This winter, at the expense of letting some of the other work go, we are having a check made of certain waters with a view of establishing rearing ponds in those which prove practical from a standpoint of feed, temperature and volume of water during the winter months. There are some who suggest that we have men employed for this work alone. This, in my opinion, would defeat the purpose in that there is a satisfaction in any line of endeavor in seeing the work go through to a successful finish. When men take the eggs, incubate them in the hatchery and rear the fish to the planting size and then have to turn them over to another crew to plant it would take the "romance" out of the work. It leaves an opening for "buck-passing," whereas if one crew is given the responsibility of taking care of a certain district, they will feel this responsibility and do all possible to see it go through to a successful finish. They will know where the smaller fish may be planted to the best advantage, will know where it is not at all practical to plant the smaller fish and will have a personal interest in the welfare of every fish planted.

Some of the important matters facing us at this time are screening the irrigating ditches, the rearing pond problem and the question of obtaining a steady supply of fish food. This fish screen presents many perplexing problems but within the last year there have been several which from all appearances have enough merit to warrant the expenditure of installing some this coming season. The one problem which must be considered fully is interference caused the farmer. He is the one we must deal with and it is only natural that he should look at this from a dollar and cents viewpoint against a recreational pastime. Something must be developed which will cause the farmer the minimum of trouble and we are in hopes that the coming season will prove a wheel which is practical.

At the present time the rearing pond matter is in the experimental stages; that is, the natural pond along the streams. Much has been learned of this during the last few years, with the most outstanding fact learned that worthwhile natural rearing ponds are at a premium.

It has been found that some streams have several sites which may be used successfully for this purpose while on other streams there are no sites which could be developed with any degree of success. In such cases it becomes necessary, in order to plant the larger fish, to establish a feeding station where the fish may be reared on artificial food. At most of our hatcheries there are conditions favorable to the establishment of these ponds.

It is much more efficient and economical to develop these sites, where we have the men, equipment and facilities for handling the fish, than to install the ponds on some stream and have to depend upon outside help for the feeding of these fish. This has been tried out in several instances and in the majority of cases, unless the party was very much interested, the novelty soon wore off and the fish might better then be out in the stream or lake where it could seek the natural food.

To insure ourselves of a dependable food supply for these fish it looks as though we would be forced within the next year or so to set up an establishment of our own for the raising of this food. At the present time we are using practically all of the available range horse liver secured from the companies engaged in slaughtering the range horses. These horses are getting more scarce each year and it will be but a matter of a short time until they will be a thing of the past. With the range land available in this state we could, with funds permitting, set up a place where these horses could be raised, butchered and shipped to hatcheries and rearing ponds. Horse meat has proved successful as a trout food among commercial dealers in this state and is beyond the experimental stage.

During the last year a fish drying plant was built for the two-fold purpose of ridding our waters of such predatory fish as suckers, carp and squaw fish, and utilizing the product for food in our hatcheries. This plant was erected at the Clearwater Lakes out of Missoula, and will be used next year at Lake Francis. It is so constructed that it may be dismantled, transferred to a new site and reassembled. It has a capacity of about one ton of fish per day.

To gather reliable data, especially in relation to our spawning fish, we adopted the tagging system last spring. At Georgetown this little non-corrosive tag was attached to the dorsal fin; at Lake Francis it was attached to the left gill cover of the fish. On one side is stamped "Mont." and on the reverse side is the serial number. When a fish is tagged all information is recorded, such as the date tagged, sex of fish, length, condition, any unusual mark-

(Please turn to page forty-six)

Millions of Eggs In 2-Year Period

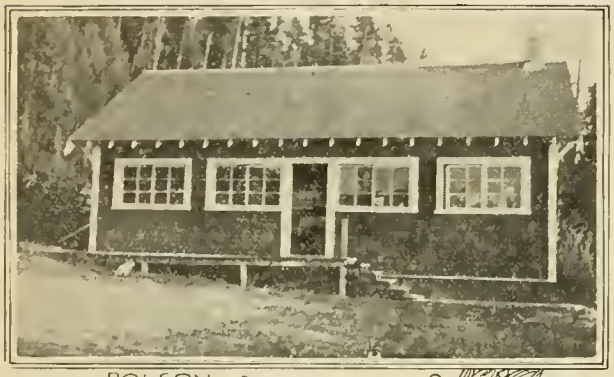
DURING the biennium, 1929-1930, a grand total of 91,592,290 game fish eggs were collected by Montana's spawn-taking stations. This total includes 63,114,900 native cutthroat trout eggs, 11,382,090 rainbow trout eggs and 17,095,300 grayling eggs. In 1929 the station at the mouth of Flint Creek at Georgetown Lake made a record of 24,119,200 natives, 520,000 rainbow and 12,031,000 grayling. The station at Lake Ronan produced 146,000 natives and 5,215,000 rainbow. In 1930 the Georgetown Lake station produced 38,849,700 natives, 304,800 rainbow and 5,064,300 grayling. The Lake Francis take of rainbow eggs in 1930 totaled 3,121,116 rainbow eggs. The Lake Ronan mark in 1930 reached 2,221,174 rainbow eggs.

Distribution Report of All Fish Hatcheries for 1930

	Native Cutthroat	Eyed Eggs	Rainbow	Eastern Brook	Loch Leven	Chinook Salmon	Grayling	Large-mouth Bass	Sunfish	Crappie	Total
Anaconda	2,686,700	150,000	176,000				3,920,000				6,932,700
Somers	2,279,000		514,000			188,840	511,000	* 112			3,492,952
Hamilton	2,960,000		262,000			180,000					3,402,000
Libby	1,004,658		115,636								1,120,294
Ovando	1,089,552										1,089,552
Polson (Station Creek)	580,500	95,000	523,000								1,198,500
Missoula	1,111,800		488,000								1,599,800
Philipsburg (Rock Creek)	983,295										983,295
Big Timber	3,063,000	270,480	145,000	117,000	1,276,000	39,200					4,910,680
Emigrant	1,755,682			297,848	250,000	48,000					2,351,530
Emigrant Ponds	22,350										22,350
Great Falls	1,230,000		497,487	159,760	703,325						2,590,572
Lewistown	1,030,900		244,950								1,275,850
Red Lodge	889,620										889,620
Valier (Lake Francis)			12,830								12,830
Miles City								120,400	56,825	†42,300	219,525
Cooperative Hatcheries:											
Divide (Butte Anglers)	1,625,000		202,000								1,827,000
McAllister (Bureau of F.)	713,000										713,000
Totals	23,025,057	515,480	3,180,903	574,608	2,229,325	456,040	4,431,000	120,400	56,825	42,300	34,632,050

*112 small-mouth. †4,500 catfish.

Montana Fish Hatcheries



POLSON

ANACONDA

SOMERS

GREAT FALLS

HAMILTON

BIG TIMBER

ROCK CREEK HATCHERY—*Philipsburg*

OVANDO

RED LODGE

EMIGRANT

LIBBY — *OLD SITE*

LEWISTOWN

MISSOULA

Montana's Fish Hatcheries.

CLIFF LAKE MADISON COUNTY— PROPOSED RAINBOW SPAWNING FIELD & HATCHERY SITE.

FLINT CREEK SPAWN TAKING STATION— AT GEORGETOWN LAKE—

ARTESIAN WELL —LAKE GARBERSON.

TANK HOUSE —LAKE GARBERSON—

LAKE RONAN— SPAWN TAKING STATION

SPAWN STATION AT STEWART MILL GEORGETOWN LAKE

LAKE FRANCIS HATCHERY

TRAPS AT LAKE FRANCIS— SPAWN TAKING STATION

Duck Food Planting Brings Benefits

By CLYDE B. TERRELL, Oshkosh, Wis.

THANKS are due sportsmen of Montana for the opportunity to present this report to the Montana Fish and Game Commission, for we feel that the general favorable results of the plantings of duck food in Montana as a whole must be a source of real satisfaction to the Commission, who have put so much time and effort into the establishment of much-needed feeding and breeding grounds for wild ducks and fish throughout the state. We have had reports from many places planted that ducks have been coming in increased numbers since plantings were made.

The question of feeding Montana's wild life is important. Wild ducks, fish and other wild life can not exist without food, and Montana can not attract and hold wild ducks on her lakes, ponds, reservoirs and streams unless an abundance of natural food and cover are provided.

This splendid work has been well begun by the Fish and Game Commission and should have the hearty endorsement of every nature lover, outdoorsman, and sportsman of your state. We believe it has, for in his work throughout the state Henry J. Hubert, our specialist in planting duck food, reports the best of cooperation from sportsmen, hunting and fishing clubs, game wardens and others. There seems to be real interest and enthusiasm among sportsmen regarding the plantings of natural feeding grounds for wild ducks and fish in Montana waters.

Planting red headed grass in North Pablo Reservoir.

The investigation in 1929 by Mr. Hubert was made in midsummer, at the best time for such an investigation—a time when the plants were matured and showing up well. Out of 385 plantings examined, 343 grew, and only 42 failed. Out of the 343 that grew, 171 produced excellent results, 86 produced good results, 58 produced fair results, and only 28 produced poor results. The results of the plantings as a whole are very good.

There are still other waters in the state where conditions are favorable for planting feeding grounds, and we feel that if the good work begun is continued in establishing an abundant supply of natural food and cover it will be the means of making Montana one of the best stopping and feeding grounds for wild ducks in this country.

During the summer of 1929 we were engaged by the Montana Fish and Game Commission to make an investigation of the waters planted in 1926 and 1927, to determine just what progress had been made.

Wapato duck potato growing at Hays Reservoir near Harlem in Blaine County.

In many instances during his investigation, Mr. Hubert found that cattle grazing on lands adjoining the waters planted trampled on the plantings, particularly the shore plants or those growing at the water's edge, damaging and killing many plants. When there is insufficient forage for livestock they will feed on such plants as wapato duck potato, wild rice, bur reed and other marsh and shallow-water plants, wherever they can get them. Much damage is also done by trampling on the plants when the livestock come to the water to feed and drink. We suggest that fencing be done to protect plantings from livestock.

Carp are injurious to beds of some wild duck foods, especially to the wild celery. These fish do not feed on the plants so much, but root them up and destroy the growth. Carp also keep the waters muddy and rily, making an unfavorable condition for growing plants, as well as for game fish life. We suggest that measures be taken to reduce the number of carp in Montana waters where they are abundant, and also that measures be taken to keep the carp under control in all Montana waters where this fish is found. After removing carp, screens can be placed in the irrigation ditches to prevent them getting back in the lakes. Suckers also are abundant in some places, and these also should be removed and kept under control.

Smartweed growing at Lake Bowdoin, planted by State Fish and Game Department with the Milk River Rod and Gun Club.

Some of the plantings were destroyed, especially the shallow-water plants, by extreme high water which drowned out the plants, and washed out some. In several instances the ducks' meat was carried away by flood waters. On the other hand some of the plantings made in shallow waters were killed out by low water. In some places the waters receded, leaving the plantings dry. Much better conditions for growing beds of these foods can be had, if a more uniform water level can be maintained so that there will not be such a fluctuation in the depth of water.

While making his investigations of Montana waters in 1929 Mr. Hubert took notes on reports from persons living near, or frequently visiting the places planted, as to whether any increase in the number of wild ducks visiting the waters had been noted since the plantings were made. Wild ducks have been reported more abundant on the waters since plantings were made at the following places:

Beaverhead County—Red Rock Lakes at Idlewild Club.

Blaine County—North Irrigation Reservoir; Three Mile Reservoir.

Cascade County—Square Butte Lake.

Deer Lodge County — Georgetown Lake.

Fallon County—Baker Lake; Mulky Dam Reservoir.

Fergus County — Hamilton Slough; Big Spring Creek.

Flathead County—Blaine Lake.

Gallatin County — Upper Madison Lake.

Hill County—Assinniboine Lake; Lake Thibedeau; Lohman's Reservoir.

Judith Basin County — Campbell Slough; Rossfork Slough.

Lake County—Flathead Lake, East Bay; Frank's Pond No. 1; Kicking Horse Chain Pot Hole; Kicking Horse

Pot Hole; Meyer's Pot Hole; Pablo Reservoir.

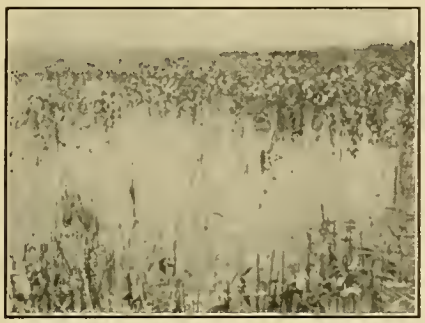
Lewis and Clark County—Lake Helena.

Madison County — Lower Madison Lake.

Missoula—Pot Hole on L. H. Gleason Ranch.

Park County—Larson Slough; Middle and Lower Daily Lakes; Upper Daily Lake.

Phillips County—Lake Bowdoin.



Wapato duck potato growing at Rattlesnake Butte Lake, near Billings.

Pondera County—Kester Lake; Lake Francis.

Powell County—Brown Lake; Jones Lake; Kleinschmidt Lake; Williams' Slough No. 1.

Rosebud County—Stellar Lake.

Sheridan County—Medicine Lake and Lake Creek; Winters Lake.

Sweet Grass County — Lake Adam; Lake Lovald; Lake Walvord.

Teton County—Nelson Reservoir (also called Daley Lake); Priest Lake; Stinson Slough.

Yellowstone County—Brown's Lake; Clayton Slough No. 1; Clayton Slough No. 2; Rattlesnake Butte Lake.

To Duke, Deceased

Friend that had the honest eyes
That would gleam at each kind word,
Or grow shadowed with surprise
When an angry tone he heard;
Friend who never tired of play,
Willing, eager, all the while—
Have you found some other way
To go playing, mile on mile?

"Duke," they say you had no soul;
That you perished as a clod.
Endless centuries may roll
Over the small mound of sod,
With its rudely-whittled board,
Telling, "Here lies 'Duke,' a dog,"
That you had no soul that soared
Onward through this early fog.

Yet you never told a lie,
Never learned to use deceit,
Never led a path awry
For some fellow being's feet,
Never caused a single tear,
Save upon the day you died.
And they say your end is here,
Though eternity is wide.

We can count a hundred things—
Brave, bold things—all done by you.
Deeds such as heroic kings
Had not been ashamed to do.
Most of all, though, it is fine
To recall the heart you had
And to know that, dog of mine,
You were, at all times, glad.

Dog—a dog—and that's the end;
End of comradeship and play?
Listen, dog that was my friend,
If you wait upon the way
That leads through the outer dark,
When my time has come to go,
Let me hear your welcome bark,
If you may, you will, I know.

EARLY RECREATION GROUNDS

The earliest form of a public preserve devoted to outdoor recreation in the territory of the present United States was a city park, Boston common, acquired in 1634. The next example of public action of this kind covered a field related to that at present usually held by state agencies—the reservation to the people for "fishing and fowling" by an ordinance of the Massachusetts Bay colony in 1641 of "great ponds," water surfaces of ten acres or more. The first state park of larger size set apart primarily for recreation was one which is now a famous national park—Yosemite. Congress ceded the valley and a mile-wide border around it to California as a state park in 1865. It was later returned to federal control.

TRAPSHOOTERS' LAMENT

I've laid away the weapon, and I surely had good cause,
For I've got a stiffened elbow, and my eyes ain't what they was,
And my knees don't seem so steady as they did in days of yore,
I've kinder gone to pieces: I ain't shootin' any more.
I have put away the weapon: and it kinder made me sigh
To think of all the pleasure that I was puttin' bye.
You'll never see my name again, when you're readin' of the score:
I've put away the weapon: I ain't shootin' any more.
If you could give me back the years and all my old-time friends
So that for each thoughtless word and act that I could make amends,
I'd give you anything I've got—No, I won't say no more:
There ain't no use in dreamin': I ain't shootin' any more.

Steady, Pal, There's Chinks and Huns In Sniffin' Distance

This splendid photograph of a pointer in action was taken by Charles L. Sheely of Spokane, photographer for The Spokane Chronicle, while on a trip afield in Montana. The scene in the stubble, with the ground covered with its snow mantle and the liver-colored spotted friend of man all business, causes thrills to bounce off the vertebrae of the sportsman.

Has Montana A Stream Pollution Problem?

By H. B. FOOTE, Sanitary Engineer, Montana State Board of Health

H. B. Foote

TO UNDERstand more clearly the points which are to be raised in this discussion and to understand what confronts us, it will be well to characterize or define stream pollution. There are three main characteristics of water, the physical, chemical and biological. By the physical characteristics is meant the turbidity, the temperature, color and odor; by the chemical the alkalinity, hardness, organic content, and such, and by the biological all plants and animals found in the water from microscopic bacteria and one-celled animals to the higher forms, or those characteristics determined by any life which might be in the water. Now streams are the natural drainage courses of our land, receiving the run-off from all catchment areas. The waters of these streams, therefore, are changed in their characteristics by the run-off from watersheds. Even before there appear on the watersheds any human habitations or activities, run-off will affect the characteristics of the main stream. But we will not in this discussion consider those natural agencies over which man has no control. Changes effected by man or his presence and operation on a catchment area are included.

We have, therefore, two types of wastes causing stream pollution, and originating from the presence of man in the region affected. The first, or domestic wastes, include city sewage and drainage from refuse and garbage, thrown on the banks. Domestic wastes also include drainage from ranches, stock pens and from any recreational establishments which may be adjacent to the stream or on the watershed. The second, or industrial wastes, include those from mining and smelting activities, from railroad operations such as oil wastes or silt from gravel washing. The lumbering industry has by-products which are included in industrial wastes such as sawdust and similar materials. Then there are many manufacturing establishments, each having its own peculiar type of waste. In Montana we have the beet sugar factories, meat packing establishments and many others. Stream pollution, therefore, would be the change in a stream caused by the drainage from these features produced by man's activities.

Of course, if a stream is large and the amount of polluting material is small so that neither the physical, chemical or biological characteristics of the water are changed, we would not consider that stream pollution existed. It is only when the changes are obvious or can be determined upon proper analysis that we would say that stream pollution exists.

Stream pollution as characterized above does exist in Montana. Silver Bow Creek almost from its source receives industrial and domestic wastes which profoundly change the physical, chemical and biological characteristics of its waters. The effects of these polluting materials can be seen far down the course of the stream although diluting water may have entered at lower points.

In the north the Milk River, upon its return to the state from Canada, receives pollution from domestic and industrial wastes, which permanently changes its characteristics.

In the east the Yellowstone River and its tributaries all receive waste, which constitutes pollution.

In fact, all our streams, with the possible exception of a few small ones that are near the borders, or near their own origins, receive somewhere along their courses some polluting material before they leave the state. This doubtless is obvious to residents acquainted with conditions, although it seems to be rather surprising to visitors, since it seems to be the opinion among many that waters so near the mountains should retain their primal purity.

Knowing what constitutes stream pollution, and having knowledge that stream pollution exists in this state, the question naturally arises: Does it constitute a problem, and, if so, can anything be done about it?

There is a problem of stream pollution in Montana. The problem arises from the use to which any stream in question is put and the use depends, of course, upon the locality and the natural resources which are being developed in that vicinity. In a strictly agricultural region we do not usually find the varied manufacturing products and wastes. The pollution is largely domestic in character, although there may be some industrial wastes from sugar factories, meat packing establishments and perhaps railroading. In the mountainous areas where ore-bearing rocks are found we naturally find mining and allied industries, and also lumbering activities. If these are extensive, then we have added the domestic waste.

It can be readily seen that from the very nature of the situation one immediately finds interests diametrically opposed one to another. Our liquid wastes must gravitate to the streams and the water of these same streams is a prime necessity in practically all our civic, industrial and recreational activities.

While there may be some instances in which all pollution may be prevented, we have long since receded from the position of expecting all our streams to be maintained in their original purity. Our industrial and civic development would be seriously arrested were such a policy to be enforced. There must be a certain amount of use of the streams as wasteways. There must, therefore, be some concession on the part of the various interests along any one waterway or stream.

As illustrations of this point: we can not expect all mining and smelting activities to cease that a certain stream may thereby be made a paradise for fishermen. We can not expect all city sewage and drainage to be stopped in order that ranchers or a city below may thereby be enabled to use the untreated water for drinking and other domestic purposes. We can not expect all ranchers to keep their stock from the streams to benefit a city or industry located below them.

There must be a middle ground where the demands of one party are reasonably met by those of a second party using the waters below.

As an illustration of this point we believe that the domestic sewage of one city should be treated sufficiently so as not to cause an odor or aesthetic nuisance to ranchers or travelers along its course and so as not to produce an unreasonable burden of purification upon the city below.

Conditions are not as we would like to have them in all instances, though fortunately we have but few acute situations in the state at this time. Nevertheless, we must not close our eyes to the trend of conditions in the state. Now is the time for us to lay out a plan of procedure to the end that conditions will not get out of hand, and that acute situations will not multiply.

As an aid I have recently advanced the argument that our methods of financing the operation of municipal sewage disposal systems can be improved upon. At the present time any expense incurred for this purpose is met from the city's general fund. Such money as is available in this fund is obtained by direct taxation. This general fund as a rule is overburdened, consequently the city council feels obliged to reduce expenses as much as possible. One place to reduce is at the end of the sewer. Hence treating plants are not built, or if built are allowed to run unattended, and sooner or later become useless. Of course, there are exceptions. There are a few sewage treatment plants which are kept in excellent operating condition.

But by fixing a moderate sewer rental fee based upon water meter readings or water flat rates the city council will have an income independent of direct taxation. The users of

the sewers will pay for service rendered, the general fund of the city will be relieved of a part of its burden, and money will be available for the proper operation of efficient treating plants.

This scheme is in operation in Ohio and Michigan. Mr. Sperry, executive secretary and chief engineer of the Michigan Stream Pollution Commission, has endorsed it highly and in Ohio there are many cities which have levied sewer rental fees.

This in my opinion would help care for stream pollution conditions as set up by municipal sewage and wastes and I believe that the situation in Montana as a whole would be improved if such a plan were instituted here.

I do not want to leave the impression that nothing is being done to control the situation in Montana. The State Board of Health is granted authority under the law so that it may study and in a measure control stream conditions which are used for public water supplies. Under this authority much study has been carried on and a policy has been set up which affects many of our larger communities. While I can speak for the State Board of Health only, I am sure that there are other state bodies which to a limited extent at least are controlling conditions of waters in the state.

But there is nowhere available, to my knowledge, sufficient information on which any one may at this time base definite and all-inclusive recommendations, for the satisfactory answer to all questions. More information is needed and I wish to pass on to you a plan suggested by J. S. James, state engineer.

In this plan a fact-finding body of men would be created and given sufficient authority to collect, tabulate and summarize information concerning this important phase of our state business. From the information gained, say over a two-year period, conclusions could be drawn and a report made with recommendations as to the program to be instituted in order to realize for us all the best utilization of our water resources.

I would, therefore, recommend that the legislature authorize the governor to select representatives from existing state bodies, such as the Board of Health, Fish and Game Commission, state engineer's office, and Livestock Sanitary Board and from such other extra governmental bodies as are vitally interested in water resources and uses and to form from them an ex-officio body to study conditions from all standpoints, collect all necessary data and report their findings with recommendations to the legislature in 1933.

The state bodies having facilities for gathering the information, have indeed already gathered much, and it only becomes necessary to collect this, add what is missing, and analyze it from the standpoint of the best utilization of our vast water resources.

PRETTY LITTLE FOX

Teacher: Rastus, what animal is most noted for its fur?

Rastus: De skunk; de more fur you gits away from him de better it is fur you.

Swiftwater Bill Breaks Loose Again

Swiftwater Wooes the Muse

SWIFTWATER BILL has been a highly respected citizen of Thompson Falls for a good many years, having located there, so he says himself, when the beautiful mountains which now surround that delightful community were holes in the ground. During the years Swiftwater Bill has lived there he has told tales of many unusual experiences and yarns of many remarkable things he has seen. So unusual are some of these tales that we fellows, who belong to a generation a bit younger than that which produced Swiftwater, were inclined to believe that this kindly old fellow was striuging us a little.

We were so thoroughly convinced of this fact that we recently issued a challenge to the rest of the state to produce a better specimen than Swiftwater Bill. This challenge was accompanied by one of Swiftwater's best yarns and brought fame to him through the columns of MONTANA WILD LIFE.

When Swiftwater Bill learned of this his feelings were seared. It was the first thing that ever happened which caused him to realize that "the words of truth he'd spoken" had been taken with a grain of salt. So deep were his emotions that he picked up his battered guitar, strummed a tune, which sounded like the first part of the Bum's Song, and related, to music, the following tales:

(We still challenge the rest of the state to produce a man who can beat "Our Bill" tellin' 'em by note.)

Here's where the breeze begins:

Oh! I am a storm-cut mountain man.
I've climbed these ridges steep,
With many a cut, a bump, and a bruise,
from crossin' the canyons deep;
But I want to live where the wild
winds blow, out in the good fresh air,
Where you sleep like a baby, you work
like a horse, and eat like a grizzly
bear.
I don't expect you to believe all I tell,
just keep this under your lid,
But I put a top on the Mission Range
when Paul Bunion wuz a kid.
I worked for Bunion for six long years
and never stopped for breath,
I wouldn't lie, but I'm the guy, that
worked his Blue Ox to death.

I know of a land where the whitetail
deer grow seventy-five feet high,
You could shoot 'em as dead as hell,
but it'll take 'em a year to die;
They built a road through this gentle
land, too late they learned their
mistake,
They'd built ten miles of a good highway on the back of a sleepy snake.
In the spring of the year the snake
caught cold, and found that he'd
have to sneeze,
He humped up his back and let 'er
go, and he wrecked ten Model T's.

I know of a land, of a square hundred
miles, where there isn't a man or
child,
But women, O boy! there's thousands
of them, and every dang one is wild;
I once had a pal, a venturesome lad,
who said he'd like one for a wife,
So many wild women took out after
him, that he barely escaped with his
life.

Fishin' one day, I landed a "Char," he
weighed 'round about fifty pound,
And say! when I opened that big baby
up, you'd never guess what I found;
The sight I revealed with me trusty
knife, it almost made me squirm,
For out of his bloomiu' innards jumped,
a seventy-five pound worm.
He looked at the sun and yawned a
bit, then started across the bar,
He said, "Bill, you've ruined my home
till I find me another big Char."

So give me the land where no woman's
foot has ever touched the sod,
Give me a fly, a leader and line, strung
on a bamboo rod;
Give me a shack, by a crystal spring,
deep in a shaded dell,
Give me my pal, a dog and a gun, and
the rest of yez go to hell.

WATCH YOUR MATCHES

An infinitesimal slither of a tree, with its head turned by a speck of civilized sulphur and the touch of a civilized hand, will burn and destroy a great forest containing millions of feet of lumber and many billions of slithers the size of a match.

QUAIL'S SPAN OF LIFE

Observations have seldom been made as to how long has a quail been known to live. One case is recorded, however, in which a quail with a leg band bearing the date of 1901 was shot in 1919. It then weighed 16 ounces on the druggist's scales.

Game Law Violations Hit the Peak

By JACK W. CARNEY, Helena, Assistant State Fish and Game Warden

Jack W. Carney

MONTANA has suffered a plague of game law violations during 1930 more severe than in any year in the history of the State Fish and Game Department. During the 18 years since 1913, when accurate information was first kept of violations, no such malicious onslaughts have been made on the diminishing supply of fish and game as during the last year when a total of 514 arrests were made in the 56 counties, fines totaling $16,293 being levied and 45 miscreants sentenced to jail. Complete reports for the year show that nine sentences were suspended, fines totaling $1,190 were remitted or suspended and 37 cases were dismissed.

Here's the record of arrests since 1913:

1913	49
1914	123
1915	237
1916	156
1917	171
1918	219
1919	60
1920	116
1921	278
1922	336
1923	403
1924	328
1925	482
1926	366
1927	345
1928	407
1929	431
1930	514

Deer Lodge county leads the list of violations by counties with 47, and a total of $1,032 in fines levied. Flathead saw 32 arrests, Beaverhead 28, Lincoln 26, Madison 23, Gallatin 23, Silver Bow 19, Stillwater 18, Yellowstone 21, Big Horn 15, Lewis and Clark 16, Cascade 13, Chouteau 13, Lake 15, Missoula 19, Granite 11, and other counties with smaller numbers.

The greatest number of law violators were arrested and convicted for shipping furs outside the state without a permit required by law. This total reached 86.

Fishing without a license was expensive for 54 anglers.

Making false affidavit in securing a hunting and fishing license caused 31 to face the judge, while 23 were arrested for trapping fur-bearing animals without a permit.

Beaver trappers operating without a permit brought 21 arrests. Killing deer out of season brought 42 into court. Fishing in closed streams was followed by 47 arrests. Fishing after closed hours in Georgetown Lake resulted in the arrest of 12.

Each succeeding year sees not only heavier drains being made on our fish and game, but witnesses the growth of law violations in forest, field and stream.

Montana's Beaver Worth Millions

IF beaver hides have averaged $20 each in value during the last 10 years, the 60,158 skins legally taken and tagged by the State Fish and Game Department would have a value of $1,203,160. The tagging fee is 50 cents and the state law requires that all beaver taken on trapping permits where they are causing damage to agricultural areas shall be shipped to the department, tagged and recorded. Prior to 1921 the state law made no provision for the tagging. During 1929 a total of 8,154 hides were tagged, while in 1930 the figure reached 8,692. The record since 1921 follows:

1921	479
1922	2,430
1923	2,339
1924	3,184
1925	6,190
1926	9,714
1927	9,227
1928	5,749
1929	8,154
1930	8,692
Total	60,158

Beaver Permits Hit 526 In Year

COMPLAINTS of farmers and industrial leaders of Montana that beaver have been damming creeks and causing backwater to flood valuable areas during 1930 have resulted in the issuance of 526 beaver trapping permits at $10 each during the years by the State Fish and Game Department. Applications for beaver trapping permits must show damage and must be filed prior to November 1 of each year. Before permits are issued an investigation is made by a deputy game warden. Records of the department show that the peak in beaver trapping permits was reached in 1927 when the mark reached 641. During 1919-1920 the fee was waived by law. The following table shows the number of permits issued since 1917:

1917	213
1918	100
1919	.....
1920	.....
1921	242
1922	244
1923	259
1924	139
1925	562
1926	607
1927	641
1928	613
1929	582
1930	526

The legal toll is too heavy and the illegal toll being constantly taken makes the burden oppressive. If Montana's natural heritage of wild life is to be conserved and propagated, increased vigilance must be maintained in cooperation with agencies of production such as the hatcheries and the game farm.

In many of the counties where few violations have been reported, funds of the state department have been insufficient to employ deputy game wardens, while in those where the greatest number of violations are shown, the deputies have been keenly alert in the protection of fish and game.

Montana has an area of more than 90,000,000 acres or 140,997 square miles, the third largest state in the Union. The official population in the 1930 census totaled 537,606, or about four people to the square mile.

Sincere attempts to enforce the fish and game laws in this vast area have been made by 27 deputy game wardens.

Few states in the Union have reached achievements of Pennsylvania. That state has an area of 45,126 square miles, as against Montana's 140,997 square miles, a population above 10,000,000 and estimated wealth of nearly thirty billion dollars as against the two and a quarter billion dollars estimated for Montana by the World Almanac.

Yet Montana, with her enormous domain, is the summer playground of thousands of eastern visitors, as well as resident sportsmen and in 1929 the sale of resident hunting and fishing licenses in Montana reached the peak with a total of 83,388, with non-resident licenses showing an equal increase.

Records compiled by the State Fish and Game Department show that 868 trappers' licenses were issued during 1930 at $10 each.

During 1929 a total of 582 permits to trap beaver which were causing actual damage to agricultural areas or industries were issued by the department, and in 1930 the total reached 526. These permits are issued on payment of a fee of $10 and before being granted an inspection of the premises is made by a deputy game warden to guard against complications. The matter of preserving the beaver, yet keeping the fur-bearing animals aloof from damaging industry, is a problem. The value of hides of the beaver already legally trapped has passed the million dollar mark during the last decade.

Montana should have a deer and elk tagging law in order that law enforcement might be simplified and the department enabled to maintain a close check on the kill in various counties. Nine states now have this tagging system and it works out to the benefit of sportsmen as well as to the department. The laws in other states require

that the tag torn from the license shall be immediately attached to the deer or elk and not removed until the carcass is consumed. Hence, any deer or elk found without the tag is an illegally killed animal. Once the tag is torn from the license, the hnnter in possession of another deer or elk is immediately confronted with prosecution.

The state department during the year has issued licenses to 221 fur farmers of Montana. This is one of the state's growing industries and the permits have been issued only after careful inspection of grounds and waters by deputy game wardens.

Careful check is made on all fur dealers of the state. During 1929 a total of 134 resident fur dealers' licenses were issued by the department at $1 and during the year 1930, which has just closed, 117 resident fur dealers' licenses were issued.

Iu 1929 a total of 31 agents for fur dealers were licensed to operate in the state at $10 each, while in 1930 there were 14 such licenses issued.

In 1929 six non-resident fur dealers were licensed to operate in the state by payment of the fee of $25 and in 1930 the same number of licenses was issued.

How About You?

I want to go where the trees are fine,
Cedar and tamarac and fir and pine,
That lift their heads to the azure haze
In the gleam and glow of monntain days.
Where the sun is bright and the skies are blue—
I want to go there; say, how about you?

I want to go where the song of a stream
Lies on my soul like a golden dream.
Where the gray rocks tower serene, sublime,
Like monuments on the shore of Time.
Where the meadows are swathed in the morning dew—
I want to go there; say, how about you?

I want to go where the red dirt spills
Its cloak of dream on the ancient hills.
Where the ferns are lush by the shaded banks,
And the forest's trees are marshalled ranks.
Where the softened sunbeams filter through—
I want to go there; say, how about you?

FISH AND GAME LAW VIOLATIONS

	1929	1930
Alien in possession of firearms without license	13	8
Catching over the limit of game fish	2	5
Catching more than 5 fish under 7 in. in length	10	9
Dumping refuse in stream	3	.....
Fishing without a license	67	54
Fishing through the ice	2	3
Fishing in closed streams	19	47
Fishing during closed season	5	15
Fishing with more than 1 pole, line and hook and set line	4	3
Hunting without a license	9	11
Hunting on game preserve	4	18
Illegal possession of beaver hides	13	5
Killing a moose	2	2
Killing elk out of season	4	13
Killing deer out of season	30	42
Killing grouse, prairie chicken, etc., out of season	9	12
Killing Hungarian partridges	2	2
Killing doe deer	8	6
Killing deer with horns less than 4 in. in length	2	1
Killing more than one deer	2	5
Killing antelope	.....	6
Killing wild geese out of season	2	1
Killing swan	.....	3
Killing Chinese pheasants out of season	15	6
Killing elk before legal hour in Park Co.	4	.....
Killing grebe	1	.....
Making false statement in application for license	25	31
Opening muskrat houses	3	.....
Possession of a seine without a license	4	1
Seining fish without a license	5	6
Salmon eggs, fishing with same	7	7
Snagging fish	4	.....
Selling game fish	1	.....
Shipping furs from state without a permit	86	86
Shooting ducks after sunset	5	10
Shooting ducks out of season	6	3
Selling elk meat	.....	1
Selling bear hides	1	6
Trapping fur-hearing animals out of season	11	11
Trapping fur-bearing animals without a license	19	23
Trapping beaver without a permit	9	21
Trapping bear	1	.....
Possession of game animals without a fur farm license	2	1
Killing more than one elk	4	1
Shooting ducks from a motor boat	2	5
Buying furs without a license	3	4
Selling deer meat	1	2
Fishing in Georgetown Lake after 9:30 p. m.	.....	12
Killing Chinese pheasant hens	.....	4
Buying elk meat	.....	1
Selling furs without a license	.....	2
Total	431	514

1930 FINES AND VIOLATIONS

Total amount of fines imposed $16,293.15
Total number of fines assessed 404

In the 514 violations of the fish and game laws there were 404 fines assessed, 45 jail sentences, 37 cases dismissed and 39 fines suspended, totaling $1,190.25. Nine sentences were suspended during the year, and several cases are pending.

VIOLATIONS BY COUNTIES

	1929	1930
Beaverhead	10	28
Big Horn	5	15
Blaine	2	5
Broadwater	4	5
Carbon	11	8
Carter	9	4
Cascade	7	13
Chouteau	9	13
Custer	.....	4
Daniels	.....	2
Dawson	9	6
Deer Lodge	31	47
Fallon	.....	8
Fergus	7	.....
Flathead	17	32
Gallatin	16	23
Garfield	.....	2
Glacier	4	6
Golden Valley	1	2
Granite	3	11
Hill	5	5
Jefferson	7	4
Judith Basin	21	3
Lake	17	15
Lewis and Clark	5	16
Liberty	1	1
Lincoln	33	26
Madison	14	23
McCone	1	8
Meagher	8	4
Mineral	6	1
Missoula	8	19
Musselshell	.....	2
Park	18	10
Petroleum	3	1
Phillips	14	5
Pondera	2	3
Powder River	1	1
Powell	11	4
Prairie	.....	3
Ravalli	2	16
Richland	1	8
Rosebud	1	7
Roosevelt	3	9
Sanders	9	9
Sheridan	10	3
Silver Bow	26	19
Stillwater	17	18
Sweet Grass	1	4
Teton	3	1
Toole	5	6
Treasure	.....	.....
Valley	10	1
Wheatland	2	4
Wibaux	.....	.....
Yellowstone	21	21
Total	431	514

1929 FINES

Total amount of fines imposed $12,137.93
Total number of fines assessed 351

In the 431 violations of the fish and game laws there were 351 fines suspended, 16 jail sentences, 19 acquitted, and 45 suspended.

Rearing Game Birds In Captivity

By J. F. HENDRICKS, Superintendent State Game Farm

J. F. Hendricks

MONTANA'S first game farm, established by the State Fish and Game Commission on a tract of land secured from the state adjoining the hospital at Warm Springs, has achieved such results during its first year of operation as to astound sportsmen and game culturists of the west. Laid out and constructed in modern manner, and with ideal climatic conditions existing for nesting, hatching and rearing, the game farm produced enough Chinese and Mongolian pheasants within a year after it was established to enable the liberation of 6,146 young birds in 55 of the 56 counties of the state in 1930.

Completion of 112 additional wire pens, bringing the capacity to from 8,000 to 10,000 birds annually, means that additional thousands of the multicolored, foxy game birds will be released throughout the state in 1931 for the benefit of sportsmen. It likewise means that approximately 1,000 domestic biddies now clucking around Montana barnyards will be required at the state game farm to hatch out the pheasant eggs and mother the broods until the Orientals are husky enough to be released.

During the last year, when the Montana State Fish and Game Commission accomplished what is regarded by sportsmen as a modern miracle in game farming in releasing the 6,146 pheasants, the aid of 781 setting hens was a dominant factor. This big flock of mamma biddies is being wintered to be ready for work in the spring.

Six acres are completely under the wire at the state game farm. There are now 392 pens, each of which will accommodate 25 birds. After the birds are liberated the pens are used again each season to care for another brood.

Breeding birds retained during the winter number 110 Chinese pheasant hens, 20 roosters, 250 Mongolian hens, 50 Mongolian roosters and 26 Hungarian partridges.

Among other fancy game birds at the farm are a pair of golden pheasants and 12 youngsters, a trio of Lady Amherst pheasants and three young ones, a trio of Reeves pheasants, a trio of silver pheasants, a trio of Melanistic Mutants, four blue grouse and 40 California valley quail. Tests are being made with these birds. Meanwhile they are being utilized for display purposes.

Incidentally, more than 2,000 Montana residents keenly interested in progress being made at the game farm, visited the scenic spot during the summer season, according to estimates of the superintendent. On one Sunday last June 75 cars were counted at the farm.

Montana's climatic conditions are ideal for rearing game birds artificially in captivity, not a pheasant having been lost because of climatic conditions.

Pheasants Liberated In Counties

Beaverhead	244
Big Horn	168
Blaine	84
Broadwater	84
Carbon	140
Carter	108
Cascade	144
Chouteau	120
Custer	96
Daniels	72
Dawson	96
Deer Lodge	155
Fallon	72
Fergus	162
Flathead	168
Gallatin	68
Garfield	72
Glacier	36
Golden Valley	96
Granite	48
Hill	144
Jefferson	124
Judith Basin	92
Lake	120
Lewis and Clark	250
Liberty	72
Lincoln	96
Madison	374
McCone	72
Meagher	96
Mineral	.....
Missoula	96
Musselshell	96
Park	120
Petroleum	82
Phillips	96
Pondera	120
Powder River	48
Powell	150
Prairie	96
Ravalli	216
Richland	96
Roosevelt	87
Rosebud	96
Sanders	48
Sheridan	88
Silver Bow	24
Stillwater	116
Sweet Grass	120
Teton	96
Toole	72
Treasure	96
Valley	108
Wheatland	72
Wibaux	96
Yellowstone	138
Total	6,146

With additional revenue provided through the proposed increase in the resident hunting and fishing license fee which will be acted upon by the legislature, it is hoped that funds will be made available to establish other similar game farms in Montana.

I came to Warm Springs July 17, 1929, to construct the first game farm for the State Fish and Game Department of Montana. The site chosen by the Commission was fifteen or more acres belonging to the State Hospital. The Commission was given use of the area as long as desired.

The first thing I did was to construct five pens to hold breeding stock I was instructed to buy for the next year's use. These birds were purchased from private farms in Washington and California. They arrived by the middle of September. Not knowing climatic conditions of the state, I did not know just how the birds would thrive, but lost only one bird during the winter, proving to me that pheasants will thrive here as well as in neighboring states.

On October 12, 1929, the Commission met in Anaconda to make final plans for the farm, and soon afterward the contract was let to construct the house and feed room with garage combined. A modern five-room house was completed in December. The other building was finished later.

We started constructing the pens about the middle of November. They were completed in February. There were 280 pens 24 by 24 feet built. They are 7 feet high. After this was done we had to make our equipment, which consists of 225 brood coops, 100 sections of setting hen nests, feed boards for all pens, and 30 shipping crates. All this had to be completed before the breeding season began.

During the winter we trapped 24 Hungarian partridges which were put in the mating pen. Nine pairs mated, and the others were liberated.

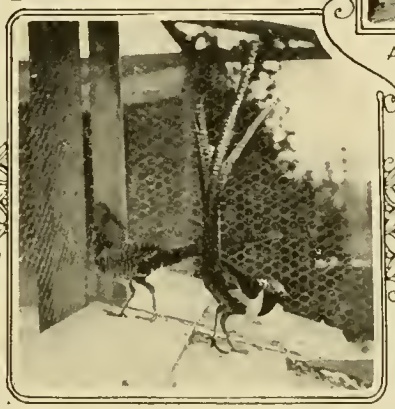
About March 15 we began mating the pheasants. In doing so we took one cock and six hens and placed them in a pen. After they became accustomed to new quarters, we began to feed them laying feed, which consists of Spratt's game meal, three times a week and on alternate days ground liver mixed with cornmeal and bran. Grain is kept before them all the time, also grit mixed with charcoal.

Much to my surprise on March 29 we found the first egg. From that time on they kept laying till they were liberated. During the season we collected about 12,000 eggs from 262 hens. Domestic hens are dusted and put in temporary nests to ascertain if they will set well before placed on the eggs. If so they are set on 20 eggs. These eggs hatch in 23 days. After hatching a hen is placed in a brood coop with 25 chicks where they are left till time for liberation.

Montana's Game Farm

A PEN OF MONGOLIAN AND CHINA COCKS

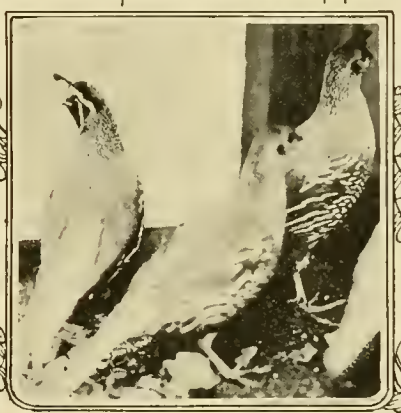
BLUE GROUSE



A PAIR OF LADY AMHERSTS

THE SUPERENTENDENTS HOME

A PAIR OF GOLDEN PHEASANTS

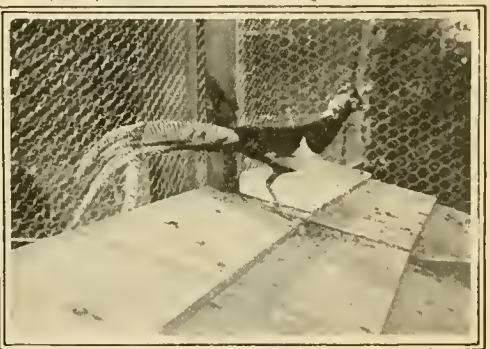


CALIFORNIA VALLEY QUAIL

FEED ROOMS AND GARAGE WITH PENS IN BACKGROUND

MELENISTIC MUTANTS

SILVER PHEASANTS



LADY AMHERST COCK

PEN OF MONGOLIAN COCKS

A PAIR OF REEVE PHEASANTS

Liver as Fish Food Is Growing Scarce

BLE scientists doing intensive research work accomplished much for humanity when they discovered the youth-restoring vitamin credited with being contained in liver, necessary to maintain the health of ailing patients — but they innocently raised hob with the fish hatching industry. The problem is becoming more puzzling annually to the Montana State Fish and Game Department, with increased human demand for liver, and the solution has not yet appeared. Liver constitutes the principal food for fingerling game fish in Montana's battery of 14 fish hatcheries. No substitute of satisfactory food content has as yet been discovered, despite continued research work being conducted by department scientists. Baby trout must have their ground liver, mixed with a small amount of cereal, several times daily—and when anglers consider the fact that during the last biennium 72,953,934 game fish fingerlings were distributed in Montana streams from department hatcheries, the total tonnage of food consumed by these trout before growing to proper size for liberation may be imagined.

Statistics compiled by the state department show that 38 tons of liver or 76,000 pounds of the vitamin-bearing delicacy was fed to Montana baby trout last year. This liver was largely provided by cayuses or range horses which are canned by the Montana Horse Products Company at Butte for shipment to European countries and for sale as dog meat.

Statistics compiled by the Montana Livestock Commission at the close of 1929 show that the number of horses of all kinds exported from Montana shows a marked increase. The livestock census for 1928 for all classes of horses shows the total number in Montana to have been 417,676 while the census for 1929 shows 400,454 head or a decrease of 17,222. During 1928 there were 25,000 horses exported and 31,815 shipped to Butte for slaughter, a total of 57,624 head. In 1929 there were 54,136 horses exported and 22,640 shipped to Butte for slaughter, a total of 76,776 head. The abandoned horse law which provides for sanctioned roundups in any desired area is ridding the range of these cayuses and with them goes the available liver supply used to feed baby trout during their infancy in hatcheries and rearing ponds.

The range horse is following the trail of the buffalo and the passenger pigeon. Civilization is driving him into oblivion. Each succeeding year sees the number of wild cayuses on Montana ranges diminishing, and with the disappearance of the range horse goes the available liver supply for Montana's game fish. Ailing patients under care of modern physicians require all the available calves' liver in local butcher shops. They are eating it as fast as it is produced and paying a handsome price, whereas it was but a few years ago that the butcher "threw in a chunk of liver" with every order, to keep the family Towser in dog meat.

Montana's State Fish and Game Commission has conducted a series of scientific tests extending over a period of years to find a substitute for liver as fish food. Perhaps one of the most successful discoveries is that of using dried carp, sucker and squawfish. These non-game fish, which inhabit many lakes, and which devour the food intended for game fish under natural conditions, have been seined, skinned, and placed on racks, steamed, dried by hot air blowers, and then ground in especially constructed mills. The product, when mixed with cereals, has developed a fish food that has possibilities. The seining of these fish from Montana lakes may eventually serve the double purpose of providing food for game fish and eliminating the piscatorial hogs.

Investigations have covered the use of ground and dried horse meat, lungs and lights of cattle, sheep and hogs, dried products of animal origin such as meat and fish meals, dried milk, vegetable products, including wheat middlings, low grades of flour, shorts, soy bean meal and Mexican pinto beans. These products have been used for years in many cases, by fish culturists, yet no general agreement has been reached regarding their relative value as trout food.

The question still remains: When the range horse disappears, what of the trout food? It is but one of many problems with which the State Fish and Game Department is confronted in its campaign of conscientious conservation of wild life resources.

Research work of this character is but one of the many activities of the department to which sportsmen are looking for preservation of the natural heritage in woods and waters. With funds of the department at the lowest mark in years, additional revenue must be provided to permit the work to proceed without being handicapped. Sportsmen favor an adjustment of the resident hunting and fishing license fee to attain results. Montana now charges only $2 for a resident license in face of the fact that 30 states have a higher fee and offer less in hunting and fishing.

Research work for a suitable fingerling trout food is also being conducted by the United States Bureau of Fisheries. Scientists have gone to extremes in their search. Their experiments have covered the use of the hearts of animals, liver taken from beef, hogs, sheep, cooked meats, fresh fish, dried animal products, clam heads or the by-product of the clam canneries, fish meals, shrimp meal, milk products, wheat middlings, soy bean meal, food canned for the use of fox fur farmers, cod liver oil mixed with yeast, and other products rich in vitamins. But the disappearance of the range horse and human demands for these mysterious health-restoring vitamins threaten to make it tough on the fish.

Cal Johnson Is Outdoor Editor

CAL JOHNSON, one of the nation's foremost writers of outdoor stories, has been appointed editor of Outdoor America, official magazine of the Izaak Walton League of America. Mr. Johnson was former editor of Sporting Goods Journal, New York City, and has for years been a regular contributor to outdoor publications in this country and abroad. He also is well known as a newspaper columnist on the outdoors and is the author of several books on outdoor subjects. Born and raised in the north woods of Wisconsin, Mr. Johnson obtained an early education in nature study. His wide knowledge of conservation and outdoor conditions was received from personal contact, he having fished, hunted, camped and toured in almost every noted section of the United States and Canada.

Feed for Buffalo Is Ample

BISON feeding on the national range northwest of Missoula will not have to be fed this winter as there is enough natural range grass to care for them, according to Warden Frank Rose of the national reserve. The bison have been ranging on the north side of the reserve all summer and there is enough feed in the southern part to carry them until the green grass crops up in the spring. The herd is in splendid shape, the older animals fattening and the calves growing fast.

An artesian well was struck at 130 feet at the bison range headquarters, eliminating water worries. It will not be necessary to do any pumping as a result of striking this well. The range is well watered and small springs scattered about the reserve are providing water for the animals.

Montana Sportsmen's Association

By B. F. GERRY of Missoula, Secretary

Glen A. Smith
Chairman

To those who have been acquainted with the fish and game conditions in Montana during the last three decades, progressive measures fostered by organized sportsmen of Montana and which are now in large measure written upon the statute books, there is a feeling of pride and satisfaction in looking back to dark days prior to the organized efforts of sportsmen of Montana. Not so many years ago slightly over a decade, the State Fish and Game Commission was the political bulwark of the party which happened to be in power. This organization was maintained solely by appropriations made available by the state legislature. The amount of the appropriation was generally meager and often influenced by harmony within the party and its power.

There were advocates of abolishing the Fish and Game Department and turning over the duties of the department to the sheriffs in the counties. The game laws at that time provided almost entirely for game protection, with nothing for the conservation or the building up of our game resources. Such a proposition came nearly being written upon the statutes of Montana during the legislative session of 1917 and it was probably this piece of legislation that aroused sportsmen of Montana who began to realize that if their sport was to continue they must take a more active interest in shaping the policies pursued and see to it that the department handling these matters was free from political influence of any faction.

It is probable that this proposed legislation was the outstanding element that brought about the general organization of sportsmen in Montana. Two years later the Montana Sportsmen's Association was organized in Helena, through the splendid efforts of Dr. W. M. Copenhaver, one of the outstanding sportsmen in Montana.

The earnestness with which the Montana Sportsmen's Association undertook the job of moulding public sentiment and bringing about a more complete understanding of the immense value of the great out-of-doors in Montana, with its wild life, forests, flowers and fields, is demonstrated by a review of the work accomplished.

It was first recognized that the state must have an organization free from political influence. Sportsmen therefore went about setting up the Montana State Fish and Game Commission, which would be free from politics and composed of men imbued with the idea of building up and maintaining Montana as the sportsmen's paradise. How well this was accomplished can best be understood by carefully reading Section 3653 of the Revised Fish and Game Statutes of Montana.

With such broad powers in the hands of well-informed, enthusiastic sportsmen, it is no wonder that during the last decade great progress has been made. The Fish and Game Commission is also looking forward to progressive measures that will be to the everlasting benefit to sportsmen and citizenry of Montana.

The State Fish and Game Commission is to be highly commended for work accomplished and the splendid program ahead. Sportsmen have the right to feel that their organized efforts were largely responsible in making it possible for this splendid work to be accomplished, through efforts to see that proper authority was given to the Fish and Game Department, and it is their solemn duty to see that that authority is broadened where necessary.

Organized sportsmen have not been contented to set up this system and drop the matter. They have been active in studying Montana conditions and in counselling with the Fish and Game Commission in matters of far-reaching importance to sportsmen of Montana.

The importance of game conservation and the proper code of ethics have been taken into nearly every home and hamlet in Montana. Most of the schools have been visited by the representatives of the Montana Sportsmen's Association. Future men of the out-of-doors have learned of problems ahead in this great field of wild life conservation. This work has been going on for the last decade and today finds many of the high school boys of ten years ago grown to leading, influential men of their community. Fruits of the early work of the Montana Sportsmen's Association are ripening into accomplishments destined to affect most profoundly the future of wild life.

Those who have been most closely associated with the work of the organized sportsmen of Montana realize that the code of ethics of sportsmen, both individually and collectively, has been raised to a much higher level. It would not be too much to say that if no other good comes from efforts of this association, if the men who go afield have caught the spirit of fair play these efforts have not been in vain.

One of the outstanding achievements of the Montana Sportsmen's Association has been the northern elk herd program which has been put upon a splendid foundation.

Prior to efforts of this association the future of the northern elk herd seemed beyond hope. One of the largest herds of American elk in existence was threatened with destruction if some effort was not made to provide adequate winter range. It was through efforts of the association that a federal appropriation was secured amounting to $150,000 to acquire winter range north of Yellowstone Park. At the present time satisfactory progress is under way to bring into public ownership sufficient winter range to assure perpetuation of this herd of elk.

As years roll by this accomplishment will be more thoroughly recognized. There will also be greater appreciation of sportsmen who had the foresight and determination to provide this sanctuary and to make certain that future generations will have the opportunity of enjoying hunting this splendid American game animal.

The Montana Sportsmen's Association has enlarged its program for the future. Fully realizing that conservation becomes more difficult each year and its problems more numerous, it is felt that with the combined cooperation of sportsmen's clubs throughout the state that this association can carry to completion all of its undertakings in the interest of perpetuating Montana's great out-of-doors, which is of such great value to the sportsmen and the citizenry of the state. Montana will soon be recognized as the "Treasure and Pleasure State."

Out On a Limb

Few sportsmen believe that a full grown bear will take chances with a comparatively small limb of a tree, but here's evidence that the big black boys will amble out on a limb and still get back. The picture was taken by W. M. Rush.

Montana's Fish Factories

(Continued from page thirty-three)

ings, whether ripe or not when entering the traps and, if a female, the condition of the eggs. This will give us information as to whether a trout or grayling returns to the same waters each year, growth and condition favorable to best egg production. This system could later be used as it is in Michigan, on some of the fish planted. It would here give such information as to the migration, and be some means of checking the percentage of fish which reach the adult size after planting.

It would be greatly appreciated if any one taking one of these tagged fish from the water will report the matter to the Fish and Game Department at Helena, stating the number on the tag, where the fish was caught, date caught, length (honest measure) and any unusual feature relating to it. The tag may be kept as a souvenir.

While hatcheries are helpful they will not alone solve the fishery problems. The fish gets but a very few "breaks" in his short life—they are subject to attack from every imaginable sort of enemy. Serious thought must be given to forest conservation, conservation of the vegetation upon the so-called grazing lands which have an important bearing upon the water supply during the summer months, control of all predatory birds, fish and animals which prey upon the game fish, protection of the spawning fish, stream pollution, irrigating ditches and last but not least, the angler who is still of the opinion that in order to establish his proper rating as an adept angler it is necessary for him to bring home the limit each time he sallies forth regardless of whether he has use for the catch or not. We should also do all possible to establish cordial relationship between the farmer and the fisherman.

This department gratefully acknowledges the whole-hearted cooperation and assistance that has been extended by forestry officials, especially in the planting of fish.

The department further extends its gratitude to the Montana Power Company, the Anaconda Copper Mining Company and the B. A. P. railway for many acts of whole-hearted cooperation. The department also extends its thanks to all parties who have given easements to a section of their land upon which has been built rearing ponds.

HATCHERY REPORT

Anaconda Station

This is the pioneer of our state hatcheries and occupies an important position in the propagation of trout and grayling besides being the administrative center for the spawning operations at Georgetown Lake. During the last two years a new 12-inch pipe line 2500 feet long was replaced. Twelve concrete rearing ponds were added to the six wooden ones which take care of the rearing of all the trout to the two- or three-inch size before planting. Last spring 12 wooden troughs were added to the complement of 60 concrete troughs which aid materially in the handling of the large amount of eggs which are each year eyed at this station for some of the other hatcheries. Plans are now under way for the remodeling of the large pond in front of the hatchery building for use as a rearing pond in carrying fish over the winter months and to the yearling size. A new fence is needed around the front of the property and more could be done in improving the grounds.

Big Timber

The size of this hatchery has again been doubled until it now has a complement of 72 troughs. There are four concrete ponds at this station and plans are under way at this point to install larger rearing ponds which will enable us to carry over the winter months fish for planting in the heavily fished Stillwater and Boulder Rivers. There is an abundance of wonderful water at this station. A garage and store room are badly needed at this point. There should be improvements made to the grounds, lawn, etc.

Hamilton

This is the largest hatchery in the state, having 80 concrete troughs. It is well equipped to serve the Bitter Root and upper Big Hole territory. We have also an opportunity at this point to establish larger rearing ponds and believe it would prove valuable. The grounds also need improving and there should be a combination garage and store room erected here.

Somers

During the last two years additional pipe line has been installed at this point to augment the water supply. A new two-car garage has been erected here. The most important requirement at this station is rearing pond sites which will enable us to carry fish for a longer period before planting.

Missoula

Due to the shortage of water and the low temperature during the winter months, it is not possible to operate this plant except during the summer months. We are at this time looking over all possible sites with a view of establishing rearing ponds where the fish may be held over the winter. In order to determine whether or not the water is suitable at one point a temporary pond has been installed on one of the sites and fish are being held over to determine the value of the site. This hatchery serves a territory in which natural rearing ponds along the streams are at a premium, and it is necessary to establish the artificial pond to properly care for the district.

Polson

This is one of the newer hatcheries and is now well equipped to handle the conditions in that district. It is a summer hatchery only, due to the low water temperature during the winter months.

Philipsburg

This hatchery is located about 12 miles out of Philipsburg in Trail Gulch, and serves the famous Rock Creek territory. This is the one and only hatchery in which the fish are given no artificial food, being planted as soon as the yolk sac absorbs, in the many wonderful natural rearing ponds along the different forks of the stream. We are getting some wonderful results from these plantings. The hatchery building at this point is badly in need of repair.

Libby

The old site has been abandoned and work is well under way on the new location which is on the Kalispell-Libby road, about five miles out of town. There is an abundance of ideal hatchery water at this point and a perfect setting for an installation of rearing ponds to care for the innumerable creeks and streams in this territory.

Ovando

This is another summer hatchery, due, also, to the low water temperature during the winter months. A cottage, combination garage and storeroom and an ice house should be erected at the station. Larger rearing ponds should be installed. This station serves a large territory and one absolutely void of natural rearing pond sites.

Great Falls

This station is located at Giant Springs, about five miles out of town. The water supply is furnished through a pumping plant from the Missouri River. A gasoline engine, to serve as an auxiliary power plant to the electric motors, has been recently installed. Plans are under way for the installation of rearing ponds of a larger size, either in or adjacent to the river. The buildings at this station are all in need of repair. All buildings should be reshingled. A cottage should be built for the assistant. At present this man and his family are living in the hatchery buildings, which on account of the dampness, is not at all suitable. A telephone should be installed. The grounds at this point should be improved by putting in a lawn, hedges, etc.

Emigrant

The old site at this point has but recently been abandoned and the buildings moved across the river to the old Anderson pond site. Here there is ample water and of a temperature which will assure rapid growth to the fish held over the winter months. It will take considerable money and labor to put this station in shape, but we feel satisfied that conditions will warrant this expenditure.

Lewistown

Here is one of the best hatchery sites in the state, there being an abundance of ideal hatchery water available. Plans are now under way whereby this station will be operated the year around in order to care for the natives and rainbow which will be held over the winter months and also to rear the brook trout, due to there being several creeks in that territory peculiarly adapted for this specie.

Red Lodge

This is also one of the summer hatcheries and serves the Rock Creek country and lakes of that district.

Biennium Shatters License Mark

BUSINESS may be in the doldrums, eagles on the dollars may have folded their wings and gone into temporary hibernation and industry may be suffering from imagined weakening of the buying power, but no such condition of affairs is reflected in the constantly increasing demands for fish and game in Montana. The last biennium has seen more licensed hunters and anglers abroad in the land than at any such previous time in the history of the Montana department. During 1929 the sale of resident licenses at $2 each reached the high peak when 83,388 permits were issued. Thirty other states charge a higher resident license fee. The total just compiled for 1930 shows that the number has but slightly declined to 82,331 despite the fact that other lines of commercial endeavor report a slump. Business may be slack but the business of taking fish and game continues strong.

Figures for 1930 show that 82,331 resident fishing and hunting licenses were issued at $2. The non-resident fishing licenses reached a total of 4,732 as against 4,793 in 1929—a decrease of only 61 despite the assertion that the tourist travel dwindled during the last year. Non-resident general licenses were issued to 113; non-resident limited licenses to 118; alien general licenses to two and alien fishing licenses to 279.

Silver Bow county leads the 1930 resident licenses list with a total of 8,825; Cascade is second with 6,913; Flathead is third with 5,957; Missoula shows up with 5,339; Lewis and Clark has 4,763; Yellowstone has 4,690; Deer Lodge, 2,952; Park, 2,199; Beaverhead, 2,009; Powell, 1,376; Stillwater, 1,160; Teton, 1,157; Fergus, 2,395; Gallatin, 3,280.

LICENSE SALES BY COUNTIES FOR 1929

	Resident	Non-Resident Fishing	Non-Resident Limited	Non-Resident General	Alien Fishing	Alien General
Beaverhead	2,343	178	4	2	3	.....
Big Horn	696	15	.....	.....	.....	.....
Blaine	702	.....	.....	.....	.....	.....
Broadwater	706	8	.....	.....	.....	.....
Carbon	2,084	72	.....	.....	30	.....
Carter	21	.....	.....	.....	.....	.....
Cascade	6,714	70	2	2	25	.....
Chouteau	920	5	.....	.....	1	.....
Custer	575	2	.....	.....	.....	.....
Daniels	221	.....	.....	.....	.....	.....
Dawson	624	5	.....	.....	.....	.....
Deer Lodge	3,148	72	3	2	12	.....
Fallon	11	.....	.....	.....	.....	.....
Fergus	2,408	38	1	2	.....	.....
Flathead	5,750	203	1	3	12	.....
Gallatin	4,375	1,047	15	18	26	.....
Garfield	17	.....	.....	.....	.....	.....
Glacier	596	50	.....	.....	3	.....
Golden Valley	104	5	.....	.....	.....	.....
Granite	777	35	.....	.....	.....	.....
Hill	1,756	6	2	.....	.....	.....
Jefferson	676	13	.....	.....	.....	.....
Judith Basin	1,101	12	.....	.....	.....	.....
Lake	2,038	182	.....	3	.....	.....
Lewis and Clark	4,471	145	11	29	32	.....
Liberty	126	4	.....	.....	.....	.....
Lincoln	2,128	223	.....	9	5	.....
McCone	4	.....	.....	.....	.....	.....
Madison	1,573	267	2	6	.....	.....
Meagher	678	21	.....	.....	.....	.....
Mineral	665	162	1	.....	.....	.....
Missoula	5,224	18	6	6	16	1
Musselshell	714	1	.....	.....	.....	.....
Park	2,225	129	.....	2	21	1
Petroleum	85	.....	.....	.....	.....	.....
Phillips	586	1	.....	.....	.....	.....
Pondera	1,020	10	.....	.....	.....	.....
Powder River	10	.....	.....	.....	.....	.....
Powell	1,033	18	.....	.....	2	.....
Prairie	67	.....	.....	.....	.....	.....
Ravalli	1,950	68	.....	2	.....	.....
Richland	359	.....	.....	.....	.....	.....
Roosevelt	603	.....	.....	.....	.....	.....
Rosebud	282	2	.....	.....	.....	.....
Sanders	1,603	210	5	5	3	.....
Sheridan	886	2	16	.....	.....	.....
Silver Bow	9,818	135	10	2	89	1
Stillwater	1,031	80	.....	6	3	.....
Sweet Grass	747	58	.....	.....	.....	.....
Teton	886	14	.....	2	.....	.....
Toole	878	4	.....	.....	.....	.....
Treasure	59	.....	.....	.....	.....	.....
Valley	470	.....	.....	.....	.....	.....
Wheatland	787	12	.....	.....	.....	.....
Wibaux	75	10	.....	.....	.....	.....
Yellowstone	3,992	107	5	4	6	.....
Idaho	.....	908	18	4	.....	.....
Utah	.....	15	.....	.....	.....	.....
Washington	.....	151	.....	.....	.....	.....
	83,388	4,793	102	107	290	3

LICENSE SALES BY COUNTIES FOR 1930

	Resident	Non-Resident Fishing	Non-Resident General	Non-Resident Limited	Alien General	Alien Fishing
Beaverhead	2,009	128	1	4	.....	.....
Big Horn	770	15	.....	.....	.....	.....
Blaine	586	5	.....	.....	.....	.....
Broadwater	579	11	.....	.....	.....	.....
Carbon	1,986	76	.....	.....	.....	43
Carter	18	.....	1	.....	.....	.....
Cascade	6,913	101	4	3	.....	27
Chouteau	842	.....	.....	.....	.....	1
Custer	610	.....	.....	.....	.....	.....
Daniels	167	.....	.....	.....	.....	.....
Dawson	553	.....	.....	.....	.....	.....
Deer Lodge	2,952	.....	.....	.....	.....	.....
Fallon	52	.....	.....	.....	.....	.....
Fergus	2,395	31	.....	.....	.....	1
Flathead	5,957	236	15	4	.....	23
Gallatin	3,280	494	8	20	.....	.....
Garfield	10	.....	.....	.....	.....	.....
Glacier	669	64	2	.....	.....	2
Golden Valley	123	2	.....	.....	.....	.....
Granite	757	20	.....	.....	.....	.....
Hill	1,643	11	.....	2	.....	2
Jefferson	790	16	.....	.....	.....	.....
Judith Basin	628	3	.....	.....	.....	.....
Lake	2,410	370	.....	6	.....	.....
Lewis and Clark	4,763	130	17	16	.....	17
Liberty	103	.....	.....	.....	.....	.....
Lincoln	1,968	219	13	1	.....	7
Madison	1,851	376	1	6	.....	.....
McCone	14	.....	.....	.....	.....	.....
Meagher	696	18	.....	.....	.....	.....
Mineral	715	118	.....	.....	.....	1
Missoula	5,339	200	14	18	.....	15
Musselshell	602	4	.....	1	.....	1
Park	2,199	79	13	.....	.....	15
Petroleum	73	.....	.....	.....	.....	.....
Phillips	365	.....	.....	.....	1	.....
Pondera	978	2	.....	.....	.....	.....
Powder River	8	.....	.....	.....	.....	.....
Powell	1,376	43	.....	.....	.....	5
Prairie	52	.....	.....	.....	.....	.....
Ravalli	2,250	78	.....	.....	.....	.....
Richland	215	.....	.....	.....	.....	.....
Roosevelt	519	.....	.....	.....	.....	.....
Rosebud	317	.....	.....	.....	.....	.....
Sanders	1,521	171	8	.....	.....	4
Sheridan	755	.....	.....	14	.....	.....
Silver Bow	8,825	91	1	.....	1	95
Stillwater	1,160	73	6	2	.....	.....
Sweet Grass	617	52	.....	.....	.....	.....
Teton	1,157	14	2	2	.....	.....
Toole	996	3	.....	.....	.....	.....
Treasure	77	.....	.....	.....	.....	.....
Valley	612	2	.....	.....	.....	.....
Wheatland	743	5	.....	.....	.....	.....
Wibaux	56	7	.....	.....	.....	.....
Yellowstone	4,690	81	5	8	.....	10
Idaho	20	1,107	.....	13	.....	.....
Utah	.....	6	.....	.....	.....	.....
Washington	.....	209	2	.....	.....	.....
	82,331	4,732	113	118	2	279

Financial Statement for 1929-30 Biennium

RECEIPTS FOR THE CALENDAR YEAR ENDED DECEMBER 31, 1929

HUNTING AND FISHING LICENSES

Resident (83,388 at $2)	$166,776.00
Non-Resident Fishing (4,793 at $3.50)	16,775.50
Non-Resident General (107 at $30)	3,210.00
Non-Resident Limited (102 at $10)	1,020.00
Alien Fishing (290 at $10)	2,900.00
Alien General (3 at $50)	150.00
	$190,381.50
LESS	
Fee Allowed Dealers	$ 8,698.60
Biological Fund 186—88,683 Licenses at 25c	22,170.75
	$30,869.35
Net Receipts	$159,962.15

OTHER LICENSES

Trappers (813 at $10)	$ 8,130.00
Seining (19 at $5)	95.00
Fur Farm (168 at $5)	840.00
Taxidermist (12 at $15)	180.00
Resident Fur Buyer (152 at $1)	152.00
Non-Resident Fur Buyer (4 at $25)	100.00
Guide (74 at $10)	740.00
Resident Fur Dealer (40 at $1)	40.00
Fur Dealers' Agent (21 at $10)	210.00
	$10,487.00
Beaver Permits (534 at $10)	$ 5,340.00
Beaver Tags (8,155 at 50c)	4,077.50
Shipping Permits (2,673 at 50c)	1,336.50
Alien Gun (1 at $25)	25.00
	$10,779.00
Fines	$11,790.83
Fur Sales: Predatory Animals	5,254.25
Confiscations	7,641.73
Fish Royalties	506.79
	$25,193.60
Montana Wild Life	$ 734.50
Fish Eggs	1,668.45
Forfeiture on Bond	426.60
Interest on Old Account	71.82
Various Refunds	57.44
Sale of Hay	34.50
Live Beaver	27.00
Live Badger	25.00
Chinese Pheasants	7.00
Capital Assets	2.50
Dividend on Bad Check	2.31
	$ 3,057.12

SUMMARY

Hunting and Fishing Licenses	$159,962.15
Other Licenses	10,487.00
Permits, etc.	10,779.00
Fines, Fur Sales, Confiscations, etc.	25,193.60
Sundry Incidentals	3,057.12
Total Net Income in 1929	$209,478.87

SUMMARY OF DISBURSEMENTS FOR THE YEAR ENDED DECEMBER 31, 1929

General Administration		$ 31,166.73
Game Warden	$ 5,098.70	
Assistant Game Warden	3,308.61	
Commissioners	2,894.70	
		$ 11,302.01
Eastern Division	$ 5,221.60	
Distribution of Fish	3,142.80	
Hatcheries	38,730.02	
		$ 47,094.42
Western Division	$ 5,981.04	
Distribution of Fish	3,404.23	
Hatcheries	38,990.86	
		$ 46,376.13
Deputy Game Wardens		55,038.07
Special Deputy Game Wardens		10,394.04
State Game Farm		16,084.29
Montana Wild Life		6,990.18
		$226,445.87

RECEIPTS FOR THE CALENDAR YEAR ENDED DECEMBER 31, 1930

HUNTING AND FISHING LICENSES

Resident (82,331 at $2)	$164,662.00
Non-Resident Fishing (4,732 at $3.50)	16,562.00
Non-Resident General (113 at $30)	3,390.00
Non-Resident Limited (118 at $10)	1,180.00
Alien General (2 at $50)	100.00
Alien Fishing (279 at $10)	2,790.00
	$188,684.00
LESS	
Dealers' Fees	$ 8,594.10
Biological Fund 186—87,575 Licenses at 25c	21,893.75
Net Receipts	$158,196.15

OTHER LICENSES

Trappers (1,000 at $10)	$ 10,000.00
Seining (15 at $5)	75.00
Fur Farm (165 at $5)	825.00
Taxidermist (16 at $15)	240.00
Resident Fur Buyer (139 at $1)	139.00
Non-Resident Fur Buyer (8 at $25)	200.00
Fur Buyers' Agent (16 at $10)	160.00
Guide (73 at $10)	730.00
Alien Gun (1 at $25)	25.00
	$12,394.00
Beaver Permits (594 at $10)	$ 5,940.00
Beaver Tags (8,735 at 50c)	4,367.50
Shipping Permits (2,486 at 50c)	1,243.00
	$11,550.50
Fines	$ 11,474.12
Fur Sales: Predatory Animals	6,530.75
Confiscations	3,290.58
	$21,295.45
Montana Wild Life	$ 636.70
Fish Eggs	3,705.05
Various Refunds	454.63
Sale of Live Animals	239.00
Capital Assets	480.00
Discount Allowed	1.06
Beaver Castors	30.00
Game Farm: Sale of Domestic Fowls	501.36
	$ 6,047.80

SUMMARY

Hunting and Fishing Licenses, Net	$158,196.15
Other Licenses	12,394.00
Permits	11,550.50
Fines, Fur Sales and Confiscations	21,295.45
Miscellaneous Income	6,047.80
Total Net Income for 1930	$209,483.90

SUMMARY OF DISBURSEMENTS FOR THE YEAR ENDED DECEMBER 31, 1930

General Administration	$ 37,020.49
State Game Warden	5,751.42
Assistant Game Warden	3,490.57
Commissioners	2,331.87
Superintendent of Fisheries	1,107.20
Hatcheries: Eastern Division	57,732.33
Hatcheries: Western Division	55,115.02
Deputy Game Wardens	55,624.49
Special Deputy Game Wardens	13,314.01
Game Farm	21,874.42
Montana Wild Life	4,290.08
	$257,651.90

RECEIPTS AND DISBURSEMENTS FOR 1929

	Receipts	Disbursements
January	$ 16,134.66	$ 11,517.67
February	12,976.91	10,739.07
March	4,315.45	13,204.42
April	5,835.20	18,219.11
May	6,775.23	16,968.50
June	35,878.77	26,065.77
July	31,329.20	10,711.79
August	25,510.45	19,611.76
September	15,301.00	19,197.89
October	20,813.30	22,565.55
November	19,944.08	21,374.01
December	14,664.62	36,270.33
	$209,478.87	$226,455.87

RECEIPTS AND DISBURSEMENTS FOR 1930

	Receipts	Disbursements
January	$ 9,727.75	$ 17,496.47
February	9,678.88	15,088.29
March	9,203.35	13,760.14
April	4,474.15	16,642.77
May	10,572.06	26,002.42
June	51,298.90	33,756.91
July	28,326.49	20,153.60
August	18,897.46	18,497.65
September	13,996.77	21,950.47
October	16,744.23	31,708.47
November	16,659.78	21,532.87
December	19,904.08	21,061.64
	$209,483.90	$257,651.70

DISBURSEMENTS FOR THE 1929-1930 BIENNIUM

GENERAL ADMINISTRATION

Operations

	1929	1930
Salaries: Office Staff	$5,140.25	$5,159.43
Postage	746.89	423.55
Books and Stationery	908.28	654.36
Sundry Office Supplies	572.31	1,159.61
Telegraph and Telephone	506.24	481.70
Express, Freight and Drayage	404.02	392.49
Printing and Binding	1,420.40	710.50
Bond Premiums	15.00	5.00
Legal Publications	573.34	426.58
Prizes	630.00	600.00
Auto Insurance	104.04	.....
Fire Insurance	40.00	40.00
State and County Fairs	1,252.78	1,276.67
Biological Research	3,780.86	860.17
Salary: Seining	1,000.00	150.54
Legal Expenses	162.62	96.00
Incidental Expenses	282.16	502.50
Deer Feed	578.95	756.42
Bird Feed	689.90	533.56
Duck Feed	855.07	.....
Patrol Salary	273.00	236.00
Elk Roundup	1,446.50	78.75
Seining Expense	379.73	.....
Scientific Instruction	246.69	1,333.21
Ammunition	65.80	.....
Association Dues	50.00	50.00
Refund on Fines	27.50	2.00
Rent of Land	1.00	51.00
D. R. Crawford	661.61	.....
Publicity	.....	339.00
Salary: Educational Secretary	.....	2,250.04
Travel	.....	10.80
Fish Wheels, Ladders and Screens	.....	690.74
Rearing Ponds	.....	11.50
Salary: Scientific Elk Study	.....	932.00
Beaver Tags	.....	294.00
Beaver Tagging	.....	74.75
	$22,814.94	$20,582.87

MOTION PICTURES

Salary	.....	$4,016.67
Subsistence	.....	476.70
Travel	.....	150.77
Films and Development	.....	950.35
Incidentals	.....	9.38
	.....	$5,603.87

CAPITAL EXPENDITURES

Hand Tools	$ 64.50	.....
Furniture and Fixtures	623.00	$ 63.18
Autos and Trucks	4,339.50	.....
Museum Collection	.90	.....
Boats	320.55	.....
Metal Signs	1,433.89	.....
Land and Improvements	.....	582.00
Machinery and Appliances	.....	464.65
Maiden Rock Rearing Pond	.....	1,691.97
Red Rock Dam	.....	3,235.88
Fox Lake Dam	.....	3,859.73
Fish Dryer	.....	400.14
Quail, for Liberation	.....	212.22
	$6,782.34	$10,509.77

REPAIRS AND REPLACEMENTS

Buildings and Attached Fixtures	$ 288.44	.....
Boats	35.01	.....
Seining	194.79	.....
Rearing Ponds	1,051.21	.....
Machinery and Appliances	.....	$ 83.59
Furniture and Fixtures	.....	14.25
Ditches	.....	224.34
	$1,569.45	$ 323.98

GAME WARDEN

Salary (5 mos. as State Game Warden)	$1,250.00	.....
Salary (7 mos. as Supt. of Fisheries)	2,100.00	.....
Salary (9 mos. as Supt. of Fisheries)	.....	$2,700.00
Salary (3 mos. as State Game Warden)	.....	750.00
Subsistence	560.60	580.70
Auto Expense	442.53	443.20
Auto Repairs	235.88	529.92
Auto Storage	89.50	134.90
Auto License	23.50	15.00
Other Travel	330.94	422.31
Telegraph	.75	.....
Bond Premium	65.00	60.00
Auto Insurance	.....	100.64
Incidentals	.....	14.75
	$5,098.70	$5,751.42

ASSISTANT GAME WARDEN

Salary	$2,575.00	$2,700.00
Subsistence	150.55	146.71
Auto Expense	243.40	216.07
Auto Repairs	88.00	235.74
Auto Storage	82.00	46.25
Auto License	16.00	10.00
Auto Insurance	100.50	32.90
Other Travel	48.16	97.90
Bond Premium	5.00	5.00
	$3,308.61	$3,490.57

COMMISSIONERS

Stenographer	$1,020.00	$1,020.00
Per Diem	915.00	555.00
Subsistence	391.85	219.80
Travel	254.24	338.76
Bond Premiums	25.00	25.00
Auto Expense	71.16	61.85
Telegrams and Telephone	168.95	101.53
Postage	46.00	5.00
Auto Storage	.....	2.00
Incidentals	2.50	2.93
	$2,894.70	$2,331.87

SUPERINTENDENT OF FISHERIES (3 Months)

Salary	.....	$ 900.00
Auto Expense	.....	41.75
Auto Repairs	.....	15.05
Auto Storage	.....	9.50
Subsistence	.....	68.75
Travel	.....	44.10
Telegraph and Telephone	.....	.70
Office Supplies	.....	12.35
Bond Premium	.....	15.00
	.....	$1,107.20
Grand Total	$11,302.01	$12,681.06

MONTANA WILD LIFE

	1929	1930
Salary	$1,200.00	$1,200.00
Binding Books, etc.	32.00	14.25
Postage	791.38	200.00
Illustration Cuts	851.47	801.65
Printing and Binding	3,843.50	1,852.50
Addressing and Mailing	243.00	150.00
Incidentals	28.83	2.00
Subsistence	.....	18.15
Travel	.....	3.53
Office Supplies	.....	48.00
	$6,990.18	$4,290.08

Financial Report of State Fish Hatcheries

SUMMARY OF HATCHERIES IN EASTERN DIVISION

BIG TIMBER

	1929	1930
Distribution of Fish	$1,305.12	$3,885.74
Operations	5,516.92	5,700.46
Capital Expenditures	2,207.97	3,138.85
Repairs and Replacements	1,179.69	465.87
	$10,209.70	$13,190.92

EMIGRANT

Distribution of Fish	$ 319.17	$ 708.61
Operations	4,380.65	6,960.20
Capital Expenditures	969.40	12,136.38
Repairs and Improvements	349.55	635.78
	$6,018.77	$20,440.97

GREAT FALLS

Distribution of Fish	$ 742.39	$ 525.15
Operations	5,236.37	4,581.93
Capital Expenditures	605.22	1,406.21
Repairs and Replacements	504.56	131.61
	$7,088.54	$6,644.90

LAKE FRANCIS

Operations	$3,810.26	$5,490.04
Capital Expenditures	9,281.32	2,262.27
Repairs and Replacements	119.10	350.99
	$13,210.68	$8,103.30

LEWISTOWN

Fish Distribution	$ 135.27	$ 141.65
Operations	1,508.03	1,866.61
Capital Expenditures	586.84	921.05
Repairs and Replacements	147.31	48.63
	$2,377.45	$2,977.94

RED LODGE

Fish Distribution	$ 41.29	$ 7.78
Operations	640.17	1,002.63
Capital Expenditures	175.00	7.08
Repairs and Replacements	8.96	25.50
	$ 865.42	$1,042.99

MILES CITY

	1929	1930
Fish Distribution	$ 599.56	$1,905.88
Capital Expenditures	1,502.70	158.23
Repairs and Replacements		34.10
	$2,102.26	$2,098.21
		$54,499.23
Field Superintendent, Eastern Division		3,232.60
Grand Total	$41,872.82	$57,731.83

OPERATIONS

Extra Labor	$ 1.50	*
Subsistence	10.00	
Auto Expense	27.76	
Auto Repairs	50.00	
Auto Insurance	95.90	
Oxygen	10.10	
Surveyor	75.00	
	$ 270.26	

FIELD SUPERINTENDENT

Salary	$2,400.00	$2,350.00
Subsistence	452.35	334.65
Auto Expense	117.57	62.19
Auto Repairs	161.77	213.59
Auto Storage	30.00	34.50
Auto Insurance	180.98	41.57
Other Travel	174.26	156.58
Telegraph and Telephone	50.35	31.92
Incidentals	5.10	7.60
	$3,572.38	$3,232.60

TRUCK DRIVER

Salary	$1,125.00	*
Subsistence	121.35	
Auto Expense	39.51	
Auto Repairs	80.70	
Auto Storage	6.25	
Other Travel	1.75	
Ice and Water	4.40	
	$1,378.96	
Grand Total	$5,221.60	

*Shown in Hatchery Operations for 1930.

OPERATIONS OF DEPUTY GAME WARDENS

	1929	1930
Salaries	$37,504.60	$37,620.00
Subsistence	4,280.23	4,374.65
Auto Expense	6,038.72	6,183.30
Auto Repairs	4,319.12	4,011.89
Auto Storage	639.30	742.90
Auto Licenses	190.25	247.00
Other Travel	749.66	375.27
Bond Premiums	100.85	101.25
Telegraph and Telephone	788.95	710.87
Ammunition	172.35	17.09
Horses	137.00	188.40
Boats	3.47	34.45
Incidentals	85.66	125.42
Postage and Stationery	26.91	9.04
Legal	1.00	
Auto Depreciation Allowance		$55.00
Seining		10.46
Extra Labor		17.50
	$55,038.07	$55,624.49

OPERATIONS OF SPECIAL DEPUTIES

	1929	1930
Salaries	$7,104.18	$8,679.02
Subsistence	613.04	$61.90
Auto Expense	1,365.57	1,819.92
Auto Repairs	841.31	1,190.02
Auto Storage	92.50	104.00
Auto License	15.00	56.00
Other Travel	114.56	91.12
Bond Premiums	20.00	15.00
Telegraph and Telephone	133.75	149.28
Ammunition	29.36	22.27
Horses	46.70	76.35
Incidentals	2.07	19.73
Postage and Stationery	16.00	
Boat Hire		1.40
Auto Depreciation Allowance		225.00
	$10,394.04	$13,314.01

STATE GAME FARM

CAPITAL EXPENDITURES

	1929	1930
Buildings and Fixtures	$10,030.94	$6,414.90
Hand Tools and Equipment	9.18	351.53
Furniture and Fixtures	39.75	67.00
Fencing	2,473.77	72.75
Foundation Stock	1,054.65	552.00
Land and Improvements		87.68
Auto Truck		1,300.00
Brood Hens		625.50
Incidentals		5.22
	$13,608.29	$9,476.58

OPERATIONS

Salary and Wages	$2,124.50	$7,685.00
Heat, Light and Power	39.92	182.93
Incidentals	122.34	83.75
Subsistence	29.10	142.55
Auto Storage	2.00	21.00
Bird Food	142.99	2,600.52
Legal	5.00	
Telegraph and Telephone		114.83
Office Supplies		25.32
Express		115.14
Other Travel		28.68
Hardware Supplies		38.35
Fire Insurance		104.55
Liberating Birds		379.87
Auto Repairs		18.80
Auto Expense		458.68
	$2,465.85	$12,000.27

REPAIRS AND REPLACEMENTS

Hand Tools and Petty Equipment	$ 10.15	$ 20.55
Buildings and Attached Fixtures		377.57
	$ 10.15	$ 397.57
Grand Total	$16,084.29	$21,874.42

OPERATIONS OF HATCHERIES—EASTERN DIVISION

BIG TIMBER

	1929	1930
Salaries and Wages	$2,952.48	$4,876.01
Auto Expense	193.41	456.75
Other Travel	117.95	50.34
Heat, Light and Power	317.05	177.32
Water and Ice	39.60	16.88
Fish Eggs	112.26	2.25
Fish Food	1,366.84	1,015.93
Truck Insurance	69.06	26.00
Groceries, Meat, etc.	18.50	
Hardware and Sundries	67.61	80.24
Incidentals	45.49	11.03
Express, Freight and Drayage	99.62	177.95
Telegraph and Telephone	117.05	108.74
Office Supplies		1.25
Auto Storage		6.00
Salt		8.65
Auto Repairs		334.62
Fire Insurance		220.50
	$5,516.92	$7,570.46

EMIGRANT

Salaries and Wages	$2,972.61	$5,450.83
Auto Expense	231.25	
Other Travel	3.34	
Heat, Light and Power	9.04	42.00
Water and Ice	19.00	
Fish Eggs	14.17	
Fish Food	873.84	1,287.65
Hardware and Sundries	24.65	59.10
Incidentals	10.85	4.75
Telephone	4.90	13.58
Fire Insurance	217.00	
Auto Repairs		16.40
Office Supplies		9.20
Horse Hire		1.50
Express and Drayage		42.09
Ammunition		5.00
Boat Rent		2.00
Truck Insurance		26.10
	$4,380.65	$6,960.20

GREAT FALLS

Salaries and Wages	$3,600.00	$3,219.38
Auto Expense	136.32	327.74
Other Travel	30.36	91.04
Heat, Light and Power	167.80	82.50
Ice and Water	20.20	31.45
Fish Eggs	61.62	
Fish Food	1,082.59	534.24
Groceries, Meat, etc.	40.15	5.05
Hardware, Supplies	10.00	55.15
Incidentals	47.61	9.65
Express, Freight and Drayage	32.34	20.56
Telephone	7.38	2.76
Fire Insurance		177.60
Auto Storage		.50
Auto Repairs		24.31
	$5,236.37	$4,581.93

LAKE FRANCIS

Salaries and Wages	$3,379.86	$4,258.62
Auto Expense	130.58	180.13
Auto Repairs	33.48	47.60
Auto Storage	6.50	25.50
Other Travel	1.44	65.45
Hardware and Supplies	38.10	228.73
Incidentals	.60	22.15
Telephone	2.50	33.80
Subsistence	217.20	186.14
Fire Insurance		75.00
Express, Freight and Drayage		64.81
Incidentals		2.63
Heat, Light and Power		35.00
Groceries, Meat, etc.		199.93
Ice and Water		50.00
Oil for Machinery		14.55
	$3,810.26	$5,490.04

LEWISTOWN

Salaries and Wages	$ 917.25	$1,022.01
Auto Expense	74.77	98.16
Auto Repairs	2.35	71.00
Auto Storage	.50	
Heat, Light and Power	14.35	8.25
Water and Ice	35.05	5.95
Fish Food	370.55	593.82
Groceries, Meat, etc.	21.85	
Hardware and Supplies	11.19	5.81
Incidentals	8.30	.75
Express, Freight and Drayage	11.44	1.71
Telephone	.43	.98
Fire Insurance	40.00	52.50
Other Travel		5.67
	$1,508.03	$1,866.61

MILES CITY

	1929	1930
Electric Power		$ 300.00
		$ 300.00

RED LODGE

Salaries and Wages	$ 445.00	$ 550.00
Heat, Light and Power	3.60	7.70
Fish Eggs	151.97	
Hardware and Supplies	39.60	18.24
Auto Expense		15.42
Ice and Water		3.00
Fish Food		338.82
Insurance		67.50
Salt		1.95
	$ 640.17	$1,002.63
Grand Total	$21,092.40	$27,771.87

DISTRIBUTION OF FISH—EASTERN DIVISION

BIG TIMBER

Wages	$ 352.67	$ 223.00
Tank Truck Repairs	63.40	318.22
Truck Expense	281.43	362.73
Truck Storage	5.50	13.75
Express on Empties	31.50	53.39
Express	429.11	516.78
Subsistence	80.05	252.35
Ice and Water	44.83	73.48
Oxygen	16.63	54.25
Fish Food		17.99
Telegraph and Telephone		.60
Other Travel		129.50
	$1,305.12	$2,016.04

EMIGRANT

Wages	$ 3.00	
Truck Expense	72.30	$ 477.27
Truck Repairs	97.75	28.15
Express	72.04	70.79
Subsistence	67.60	64.90
Ice and Water		60.00
Oxygen		7.50
Other Travel	6.48	
	$ 319.17	$ 708.61

GREAT FALLS

Wages	$ 6.50	$ 2.00
Truck Repairs	179.76	56.15
Truck Expense	356.97	230.10
Storage	.50	
Express on Empties	2.73	32.23
Express	24.56	40.97
Subsistence	96.10	60.00
Ice and Water	64.05	44.15
Oxygen	2.50	31.30
Telephone	8.72	6.27
Travel		21.98
	$ 742.39	$ 525 15

LEWISTOWN

Truck Expense	$ 109.25	$ 50.61
Express	26.02	29.10
Truck Repairs		18.17
Ice and Water		43.77
	$ 135.27	$ 141.65

RED LODGE

Wages	$ 3.50	
Express on Empties	11.24	$ 7.78
Subsistence	16.55	
Ice and Water	6.00	
Incidentals	4.00	
	$ 41.29	$ 7.78

MILES CITY

Wages	$ 20.45	$ 38.25
Storage	.50	
Express	81.00	80.00
Subsistence	23.75	35.40
Other Travel	473.86	1,415.21
Telegraph and Telephone		13.41
Hardware Supplies		8.29
Fish Food		15.32
	$ 599.56	$1,605.88
Grand Total	$3,142.80	$5,005.11

CAPITAL EXPENDITURES—HATCHERIES OF EASTERN DIVISION

BIG TIMBER

	1929	1930
Land and Improvements	$ 30.35	
Buildings and Attached Fixtures	82.36	$3,138.65
Machinery and Appliances	14.00	
Hand Tools	4.90	
Autos and Trucks	300.00	
Ponds	1,776.36	
	$2,207.97	$3,138.65

EMIGRANT

Land and Improvements	$ 19.40	$9,588.75
Autos and Trucks	150.00	
Fish Tank Truck	800.00	
Buildings and Attached Fixtures		1,709.05
Auto Truck		742.20
Hand Tools		69.96
Machinery and Appliances		26.42
	$ 969.40	$12,136.38

GREAT FALLS

Buildings and Attached Fixtures	$ 449.32	$ 73.14
Hand Tools	.90	
Autos and Trucks	100.00	
Ponds	55.00	
Auto Truck		525.45
Ponds		681.50
Land and Improvements		126.12
	$ 605.22	$1,406.21

LAKE FRANCIS

Buildings and Fixtures	$7,878.07	$1,872.71
Flumes	1,403.25	4.50
Land and Improvements		252.90
Furniture and Fixtures		71.65
Hand Tools		60.91
	$9,281.32	$2,262.67

LEWISTOWN

Land and Improvements	$ 12.00	$ 892.80
Buildings and Fixtures	41.00	3.25
Furniture and Fixtures		25.00
Hand Tools	6.84	
Autos and Trucks	150.00	
Ponds	377.00	
	$ 586.84	$ 921.05

RED LODGE

Autos and Trucks	$ 175.00	
Buildings and Attached Fixtures		$ 7.08
	$ 175.00	$ 7.08

MILES CITY

Land and Improvements	$ 500.00	$ 59.83
Buildings and Fixtures	1,002.70	16.70
Ditch		82.15
	$1,502.70	$ 158.23
Grand Total	$15,328.45	$20,030.27

REPAIRS AND REPLACEMENTS—HATCHERIES IN EASTERN DIVISION

BIG TIMBER

Machinery and Appliances	$ 24.70	
Hand Tools and Equipment	23.05	$ 10.05
Furniture and Fixtures	9.45	
Autos and Trucks	506.99	
Ponds	85.11	
Buildings and Attached Fixtures	530.39	292.99
Tank Truck		94.95
Sundry Supplies		67.88
	$1,179.69	$ 465.87

EMIGRANT

Machinery and Appliances	$ 15.00	$ 118.14
Hand Tools and Equipment	4.25	10.00
Furniture and Fixtures	2.65	6.50
Autos and Trucks	33.11	
Buildings and Attached Fixtures	294.54	454.07
Hardware and Supplies		47.07
	$ 349.55	$ 635.78

GREAT FALLS

Machinery and Appliances	$ 16.00	
Hand Tools and Equipment	67.90	$ 10.00
Autos and Trucks	214.88	
Buildings and Attached Fixtures	180.78	90.71
Ponds	25.00	
Tank Truck		25.20
Hardware and Supplies		5.70
	$ 504.56	$ 131.61

LAKE FRANCIS

	1929	1930
Hand Tools and Equipment	$ 65.06	
Buildings and Attached Fixtures	54.04	$ 263.71
Hardware and Supplies		87.28
	$ 119.10	$ 350.99

LEWISTOWN

Machinery and Appliances	$ 10.00	
Autos and Trucks	86.11	
Buildings and Attached Fixtures	18.00	$ 27.23
Incidentals	33.20	
Hand Tools and Petty Equipment		8.55
Hardware and Supplies		12.85
	$ 147.31	$ 48.63

MILES CITY

Tank Truck		$ 34.10
		$ 34.10

RED LODGE

Machinery and Appliances	$ 8.96	
Buildings and Attached Fixtures		$ 20.50
Hand Tools and Petty Equipment		5.00
	$ 8.96	$ 25.50
Grand Total	$2,309.17	$1,692.48

SUMMARY OF HATCHERIES IN WESTERN DIVISION

ANACONDA

Fish Distribution	$ 705.79	$1,115.37
Operations	7,443.18	8,831.60
Capital Expenditures	2,518.70	1,674.50
Repairs and Replacements	1,172.37	5,622.01
	$11,840.04	$17,243.48

HAMILTON

Fish Distribution	$ 57.87	$ 206.00
Operations	3,885.10	5,500.51
Capital Expenditures	27.75	1,004.90
Repairs and Replacements	121.87	29.83
	$4,092.59	$6,741.24

FLINT CREEK

Fish Distribution	$1,402.31	
Operations		$1,567.64
Repairs and Replacements		44.38
	$1,402.31	$1,612.02

LIBBY

Fish Distribution	$ 92.91	$ 66.89
Operations	1,720.55	2,303.28
Capital Expenditures	232.37	1,255.15
Repairs and Replacements	378.44	458.50
	$2,424.27	$4,083.82

MISSOULA

Fish Distribution	$ 396.56	$ 581.16
Operations	5,608.63	6,388.99
Capital Expenditures	1,686.63	317.91
Repairs and Replacements	261.86	111.38
	$7,953.68	$7,399.44

OVANDO

Operations	$1,383.64	$1,641.42
Capital Expenditures	32.50	
Repairs and Replacements	135.26	23.78
	$1,551.40	$1,665.20

POLSON

Fish Distribution	$ 20.00	$ 172.81
Operations	3,550.93	2,903.77
Capital Expenditures	257.78	586.65
Repairs and Replacements	333.00	35.70
	$4,170.71	$3,696.93

ROCK CREEK

Operations	$ 204.68	$ 253.09
Repairs and Replacements	111.06	
	$ 315.74	$ 253.09

RONAN

Operations	$1,424.34	$ 437.12
Capital Expenditures	49.82	20.55
Repairs and Replacements	240.26	
	$1,714.42	$ 457.67

SOMERS

	1929	1930
Fish Distribution	$ 719.79	$ 193.81
Operations	4,228.43	5,466.59
Capital Expenditures	968.59	1,986.53
Repairs and Replacements	583.42	592.39
	$6,500.23	$8,239.32
Grand Total	$41,965.39	$55,115.02

FIELD SUPERINTENDENT

Salary	$2,100.00	$2,362.50
Subsistence	254.38	167.50
Auto Expense	57.32	101.49
Auto Repairs	259.53	387.53
Auto Storage	61.00	80.50
Auto Insurance	155.56	41.99
Other Travel	36.39	30.89
Telephone	.70	2.65
Incidentals		13.45
	$2,924.88	$3,188.50

ASSISTANT SUPERINTENDENT

Salary	$ 850.00	
Subsistence	55.55	
Auto Expense	1.25	
Auto Repairs	2.75	
Auto Storage	1.00	
Other Travel	67.60	
Telephone	7.26	
Incidentals	1.00	
	$ 986.41	

FISH CULTURIST

Salary	$ 475.00	
Subsistence	266.95	
Auto Expense	31.61	
Auto Repairs	112.85	
Auto Insurance	26.10	
Telephone	.66	
Incidentals	5.00	
	$ 918.17	

TRUCK DRIVERS

Salaries	$ 909.50	
Subsistence	179.35	
Auto Expense	51.88	
Auto Repairs	4.25	
Auto Storage	2.00	
Other Travel	2.10	
Incidentals	2.00	
Ice and Water	.60	
	$1,151.58	
Grand Total	$5,981.04	$3,188.50

OPERATIONS OF HATCHERIES—WESTERN DIVISION

ANACONDA

Salaries and Wages	$4,772.01	$5,902.54
Auto Expense	927.78	937.49
Auto Storage	28.45	5.00
Other Travel	95.50	45.22
Heat, Light and Power	426.68	255.64
Ice and Water	1.75	151.00
Fish Food	608.76	684.51
Hardware and Supplies	161.93	129.01
Incidentals	69.75	18.13
Express, Freight, Drayage	244.77	41.17
Telegraph and Telephone	93.05	239.13
Fire Insurance	8.10	312.00
Subsistence	107.55	
Office Supplies	17.10	14.65
Auto Insurance		89.00
Auto Repairs		32.11
	$7,563.18	$8,856.60

GEORGETOWN LAKE

Salary and Wages		$1,062.63
Hardware Supplies		47.15
Subsistence		281.35
Telegraph and Telephone		17.80
Heat, Light and Power		11.05
Ice		1.00
Rent		1.00
Fire Insurance		122.50
Travel		8.66
Incidentals		14.50
		$1,567.64

ROCK CREEK

Wages	$ 173.48	$ 152.50
Incidentals	1.20	
Fire Insurance	30.00	
Travel		46.73
Auto Expense		23.31
Groceries, Meat, etc.		30.55
	$ 204.68	$ 253.09

HAMILTON

	1929	1930
Salaries and Wages	$2,991.66	$3,567.33
Auto Expense	206.61	364.51
Heat, Light and Power	136.30	115.02
Ice and Water	1.20	
Fish Eggs	7.10	
Fish Food	480.52	1,352.67
Hardware and Supplies	13.54	50.38
Express, Freight and Drayage	4.00	
Telephone	55.67	49.55
Subsistence	22.75	7.00
Office Supplies	5.75	
Auto Repairs		13.55
Auto Repairs		.50
Auto Storage		13.20
	$3,925.10	$5,533.71

LIBBY

Salary and Wages	$1,244.00	$2,248.00
Auto Expense	175.71	182.95
Other Travel	31.08	18.50
Ice and Water	7.10	
Fish Food	233.35	145.21
Groceries, Meat, etc.	7.10	2.15
Hardware and Supplies	74.06	4.15
Express, Freight, Drayage	2.54	6.13
Telephone	5.60	1.93
Auto Insurance		24.00
Insurance		45.00
	$1,780.55	$2,678.02

MISSOULA

Salary and Wages	$3,372.66	$3,918.52
Auto Expense	389.11	590.64
Auto Repairs	39.45	431.12
Auto Storage	1.00	5.15
Other Travel	91.14	95.50
Heat, Light and Power	478.21	274.17
Ice and Water	51.87	32.11
Fish Eggs	17.21	
Fish Food	525.24	441.75
Groceries, Meat, etc.	46.61	10.85
Hardware and Supplies	44.98	69.18
Incidentals	3.07	4.25
Telephone and Telegraph	140.91	106.85
Fire Insurance	50.00	72.90
Subsistence	24.25	
Office Supplies	2.45	
House Rent	336.00	336.00
Duck Food	66.00	
Seining	18.47	
	$5,698.63	$6,388.99

OVANDO

Salary and Wages	$ 920.00	$1,175.00
Auto Expense	141.59	148.82
Heat, Light and Power	6.00	12.00
Fish Food	222.19	238.00
Groceries, Meat, etc.	5.30	4.00
Hardware and Supplies	19.05	
Express, Freight, Drayage	7.01	
Fire Insurance	45.00	
House Rent	37.50	40.00
Salt		13.50
Auto Repairs		10.10
	$1,403.64	$1,641.42

POLSON

Salary and Wages	$2,860.25	$2,388.65
Auto Expense	337.40	299.98
Other Travel	11.50	
Fish Food	157.97	146.07
Groceries, Meat, etc.	5.50	1.60
Hardware and Supplies	91.38	14.86
Incidentals	9.58	1.25
Freight, Express, Drayage	20.26	27.38
Telephone	6.79	2.58
House Rent	60.00	
Seining	10.00	
Bird Food	30.00	6.70
Heat, Light and Power		1.62
Insurance		49.50
Auto Repairs		13.05
	$3,600.63	$2,953.24

RONAN

Salary and Wages	$1,414.34	$ 350.00
Ice and Water	10.00	10.00
Auto Expense		33.21
Groceries, Meat, etc.		3.24
Hardware Supplies		10.67
Insurance		30.00
	$1,424.34	$ 437.12

SOMERS

	1929	1930
Salary and Wages	$2,403.66	$3,543.09
Auto Expense	720.86	591.42
Other Travel	41.18	15.52
Heat, Light and Power	329.38	311.47
Fish Eggs	16.97	.....
Fish Food	510.13	570.06
Groceries, Meat, etc.	1.75	42.10
Hardware and Supplies	50.80	19.64
Incidentals	36.39	.....
Express, Freight, Drayage	75.28	31.37
Telegraph and Telephone	81.02	70.94
Office Supplies	11.01	2.50
Ice and Water	.....	16.00
Fire Insurance	.....	224.25
Auto Repairs	.....	77.23
Auto Storage	.....	1.00
	$4,278.43	$5,516.59
Grand Total	$29,879.18	$35,826.42

DISTRIBUTION OF FISH—WESTERN DIVISION

ANACONDA

Wages	$ 8.50	$ 139.50
Tank and Truck Repairs	265.49	248.85
Truck Expense	149.24	229.18
Truck Storage	1.50	.....
Express on Empties	25.83	32.76
Subsistence	210.78	158.65
Oxygen	2.50	15.29
Other Travel	17.79	72.75
Incidentals	24.16	32.75
Telegraph and Telephone	.....	19.64
Express	.....	166.00
	$ 705.79	$1,115.37

FLINT CREEK

Wages	$1,165.00	.....
Truck Repairs	7.40	.....
Subsistence	166.08	.....
Telephone	18.58	.....
Incidentals	35.05	.....
Light and Power	8.20	.....
Rent	2.00	.....
	$1,402.31	*.....

*(Included in Georgetown Lake Summary).

HAMILTON

Truck Repairs	$ 57.77	$ 11.90
Express	.10	75.32
Auto Expense	.....	20.29
Subsistence	.....	73.45
Ice and Water	.....	10.34
Auto Storage	.....	1.00
Telegraph and Telephone	.....	13.70
	$ 57 87	$ 206.00

LIBBY

Truck Repairs	$ 47.77	.....
Express	45.14	$ 40.72
Ice and Water	.....	7.15
Other Travel	.....	19.02
	$ 92.91	$ 66.89

MISSOULA

Wages	$ 16.75	$ 21.25
Truck Expense	182.81	13.58
Express	3.39	63.77
Subsistence	185.90	129.50
Fish Food	7.71	190.99
Oxygen	.....	20.00
Ice and Water	.....	22.78
Other Travel	.....	119.29
	$ 396.56	$ 581.16

POLSON

Truck Repairs	$ 6.20	.....
Truck Expense	8.65	$ 171.03
Subsistence	14.15	.45
Express	.....	1.33
	$ 29.00	$ 172.81

SOMERS

Wages	$ 539.66	.....
Truck Repairs	2.10	$ 26.16
Truck Expense	12.49	25.69
Truck Storage	1.00	1.25
Express	24.46	80.46
Subsistence	54.25	52.00
Telephone	1.17	.....
Incidentals	2.00	.....
Oxygen	.....	8.25
	$ 667.13	$ 193.81
Freight on Fish Tank	82.66	.....
Grand Total	$3,404.23	$2,336.04

CAPITAL EXPENDITURES—HATCHERIES IN WESTERN DIVISION

ANACONDA

	1929	1930
Land and Improvements	$ 60.03	.....
Buildings and Fixtures	1,281.44	$ 173.88
Tools and Equipment	7.85	3.00
Furniture and Fixtures	15.88	.....
Ponds	250.00	.....
Fish Tanks	903.50	.....
Auto Truck	.....	1,210.34
Tank Truck	.....	250.90
Seines	.....	36.38
	$2,518.70	$1,674.50

HAMILTON

Land and Improvements	$ 10.00	.....
Tools and Equipment	7.75	.....
Furniture and Fixtures	10.00	.....
Auto Trucks	.....	$1,004.90
	$ 27.75	$1,004.90

LIBBY

Land and Improvements	.....	$1,127.15
Buildings and Fixtures	$ 135.14	128.00
Furniture and Fixtures	26.50	.....
Ponds	70.73	.....
	$ 232.37	$1,255.15

MISSOULA

Land and Improvements	.....	$ 50.00
Buildings and Fixtures	$ 224.65	.....
Machinery and Appliances	648.53	267.91
Furniture and Fixtures	29.10	.....
Autos and Trucks	784.35	.....
	$1,686.63	$ 317.91

OVANDO

Furniture and Fixtures	$ 32.50	.....

POLSON

Land and Improvements	$ 42.00	.....
Buildings and Fixtures	172.97	$ 10.00
Machinery and Appliances	11.91	.....
Hand Tools and Equipment	.40	.....
Furniture and Fixtures	22.50	.....
Autos and Trucks	8.00	.....
Auto Truck	.....	576.65
	$ 257.78	$ 586.55

RONAN

Land and Improvements	$ 28.00	.....
Buildings and Fixtures	2.00	$ 20.55
Hand Tools and Equipment	19.82	.....
	$ 49.82	$ 20.55

SOMERS

Land and Improvements	.....	$ 9.00
Buildings and Fixtures	$ 220.44	479.03
Autos and Trucks	578.55	1,498.50
Boats	169.60	.....
	$ 968.59	$1,986.53
Grand Total	$5,774.14	$6,846.09

REPAIRS AND REPLACEMENTS—HATCHERIES IN WESTERN DIVISION

	1929	1930
Anaconda	$1,172.37	$5,622.01
Georgetown Lake	.....	44.38
Hamilton	121.87	29.83
Libby	378.44	458.50
Missoula	261.86	111.38
Ovando	135.26	23.78
Polson	333.00	35.70
Rock Creek	111.06	.....
Ronan	240.26	.....
Somers	583.42	592.39
Grand Total	$3,337.54	$6,917.97

Montana State Fish and Game Department

COMMISSIONERS

Thomas N. Marlowe, Chairman, Missoula
E. A. Wilson, Livingston — J. L. Kelly, Anaconda
G. T. Boyd, Great Falls — W. K. Moore, Billings
Robert H. Hill, Secretary of the Commission and State Fish and Game Warden, Helena

GAME WARDEN'S OFFICE STAFF

J. W. Carney, Assistant Game Warden — Winnefred Brackett, Secretary
James W. Cory, Cashier — Gertrude Simon, Stenographer
Floyd L. Smith, Editor, Montana Wild Life

HATCHERY SUPERINTENDENT

Kenneth F. MacDonald, Superintendent of Fisheries

STATE GAME FARM

J. F. Hendricks, Superintendent, Warm Springs

DEPUTY GAME WARDENS

Thomas O. Peasley, Helena	J. J. Meany, Plains
L. C. Clark, Havre	Harry Morgan, Ovando
Harry Cosner, Malta	P. W. Nelson, Livingston
Wm. J. Dorrington, Libby	A. A. O'Claire, Kalispell
W. A. Hill, Missoula	Fred E. Pilling, Butte
Allen T. Holmes, Billings	Chas. R. Price, Dillon
Wm. Ray Kohls, Ennis	A. D. Roushar, Great Falls
E. M. Krost, Plentywood	Frank M. Snider, Choteau
J. P. McCaffery, Anaconda	J. A. Weaver, Lewistown
H. C. Sailor, Absarokee	Frank R. Marshall, Bozeman

Thomas Danahar, West Yellowstone

SPECIAL DEPUTY GAME WARDENS

J. H. Chartrand, Miles City	Frank Beller, Gardiner
John E. Plank, Roundup	George Muxlow, Glendive
William C. Gird, Browning	J. F. Goldsby, Polson

FISH HATCHERIES AND SPAWNING STATIONS

Dr. I. H. Treece, Anaconda, Field Man

Anaconda	Leo Gilroy, Foreman
Big Timber	J. W. Schofield, Foreman
Emigrant	P. G. Bottler, Foreman
Great Falls	A. G. Stubblefield, Foreman
Hamilton	J. P. Sheehan, Foreman
Lewistown	L. R. Donaldson, Foreman
Libby	Elmer Phillips, Foreman
Missoula	O. E. Johnston, Foreman
Ovando	T. E. Day, Foreman
Philipsburg (Rock Creek)	Graham Cadwell, Foreman
Polson (Station Creek)	Eli Melton, Foreman
Red Lodge	A. E. Tanger, Foreman
Somers	M. L. Matzick, Foreman

SPAWNING STATIONS

Flint Creek, Georgetown Lake
Stewart Mill, Georgetown Lake
Lake Ronan, near Dayton
Lake Francis, near Valier
Pond Cultural Station, Miles City, J. H. Chartrand

Sec. 435½, P. L. & R.
U. S. POSTAGE
PAID
Helena, Montana
Permit No. 27

Montanas' MOUNTAIN SHEEP

EWES AND KIDS AT REST

NOT A BIT AFRAID OF THE WILD ANIMAL PHOTOGRAPHER

A SOFT, COOL BED

KID MOUNTAIN SHEEP- NINE MONTHS OLD

STARTING A FIGHT

MOUNTAIN SHEEP

A FIGHT IS IMMINENT

PHOTOS BY W. M. RUSH